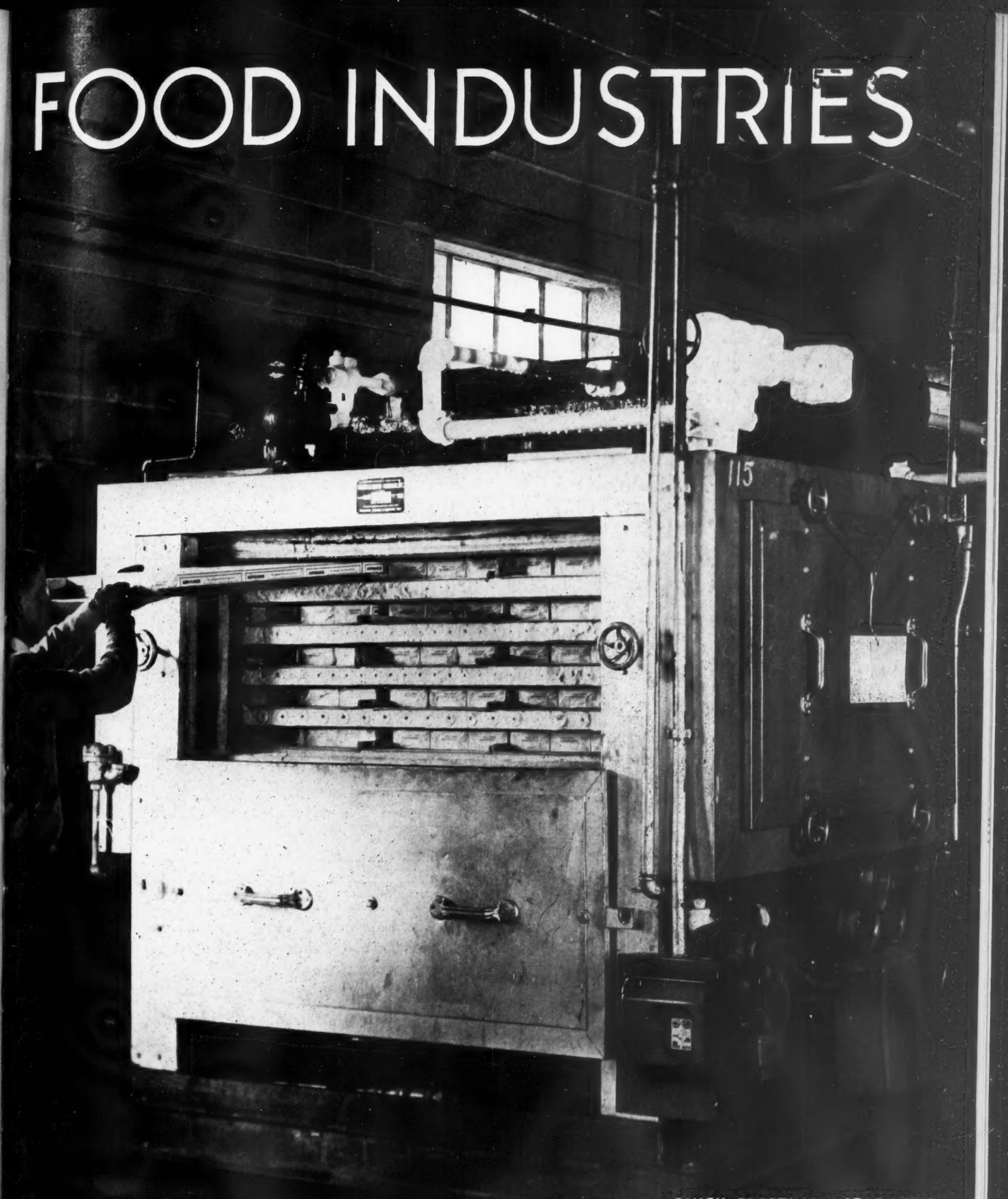
FOOD INDUSTRIES



QUICK FREEZING ASPARAGUS

JULY, 1935

The BOTTOM PRICE for Top Quality

in a 1½-ton 6-cylinder INTERNATIONAL TRUCK

$595 f. o. b. factory for the 1½-ton, 6-cylinder, 133-inch wheelbase Model C-30 chassis—standard equipment.

Also available for special needs, the 1½-ton, 4-cylinder Model C-20. Chassis prices as low as

$575 f. o. b. factory

This view of the 1½-ton International Model C-30 provides an example of the styling of the new streamlined International Trucks. The branch or dealer will be glad to demonstrate this truck or any other International in the line.

Quick Facts About

INTERNATIONAL

1½-ton 6-cylinder Model C-30

Six-cylinder engine—78.5 horsepower—hardened exhaust-valve seat inserts—full-floating rear axle—133 or 157-inch wheelbase—any desired body style—most economical in operation of all trucks in its class—lowest priced 1½-ton, 6-cylinder model in International history. Other International sizes range from ½-ton to 10-ton with chassis prices as low as $400 f. o. b. factory.

● Increased demand has greatly increased the production on the new International Model C-30, and the result is the lowest price that International Harvester has ever put on a 1½-ton, 6-cylinder truck.

That increased demand is the direct result of a combination of performance and economy in a modern truck that meets the widest range of hauling requirements.

See the Model C-30 or any other International at the nearby branch or International dealer's showroom. Look over the mechanical superiorities that have enabled International owners in every line of business to operate their trucks at lower cost for a long lifetime of service.

INTERNATIONAL HARVESTER COMPANY
OF AMERICA *(Incorporated)*
606 So. Michigan Ave. Chicago, Illinois

INTERNATIONAL TRUCKS

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FOOD INDUSTRIES

PRODUCTION • ENGINEERING • DISTRIBUTION

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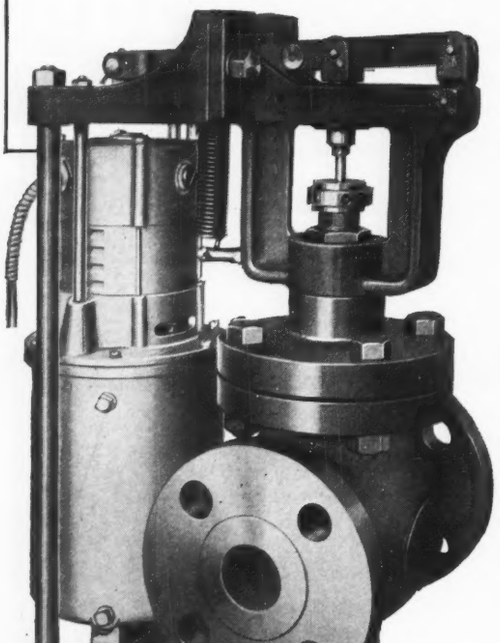
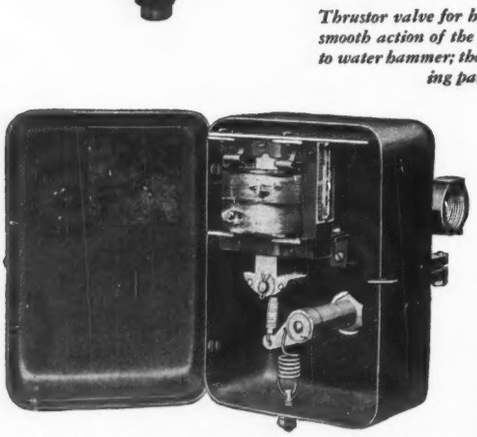


Thrustor valve for heavy duties. The smooth action of the Thrustor is a foe to water hammer; there are few wearing parts.



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GENERAL ELECTRIC

FOOD INDUSTRIES

PRODUCTION • ENGINEERING • DISTRIBUTION

Established 1928—McGraw-Hill Publishing Company, Inc.

Vol. 7, No. 7

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Laurence V. Burton, Editor

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JULY 1935

THE TALK OF THE INDUSTRY

ONE thing which is disturbing us greatly is that big celebration to which we were *not* invited where the leaders of industry toasted the downfall of governmental dictatorial interference. Being expert at shedding crocodile tears, we believe that we could have helped the celebration mightily and lustily—even raucously.

Another thing that fills us with regret is that we were not present at the White House press conference, when the President lost his temper about the Supreme Court decision in the Schechter Poultry Co. case. The last time we were in his office, we had spent a whole week thinking up a mean question to ask him. It was calculated to bring about a revelation of where the President was heading —assuming, of course, that he knew. But instead of being permitted to ask the question we were forced to listen to his tale about appointing the Commissioner of Education in Puerto

Rico. Next time we shall cultivate a poker face and conceal our diabolical intent until we can touch off the fireworks.

SOME ONE in the food industries ought to be able to write a delightful jingle about Assemblyman William Sweeney, of Wisconsin, author of the trick law requiring restaurants to serve two-thirds of an ounce of cheese and two-thirds of an ounce of butter with every meal cost-

ing 25 cents or more. We have tried it and failed. Our training in writing poetry seems to be slightly deficient.

A few weeks' observation of the operation of this cheese and butter law shows us how simple we are, and how lawless are the *restaurateurs* of Wisconsin (if one who purveys a two-bit meal rates a French title). We had supposed that each restaurant would have a piece of ripe old rancid cheese, a sort of property cheese —to borrow a theatrical term, that nobody would eat. But Wisconsin restaurant proprietors don't like the idea of rancid cheese around in fly time for they are refusing to serve any free cheese at all.

Evidently Wisconsin still has a few rugged individualists in spite of the Brothers La Follette.

A WHOLLY new and unexpected non-food market for beans has been discovered in a hotel in Chicago. The cocktail bar, arranged like the deck of a palatial yacht with marine scenery that rises and falls, produces the illusion of a ship in a gentle sea. And with each "roll" of the ship comes the realistic sound of a musical wash of waves on a low sandy beach.

Investigation discloses that this sound-effect is produced by a peck of dry beans (*Phaseolus vulgaris*) sliding back and forth on a wooden frame, the bottom of which is covered with screen wire, and tilted every eight seconds by a small motor.

Those who cannot spend their vacations at the seashore should have one of these devices in their homes, just out of sight. It should be a

great stimulant to the imagination and increase the sale of beans by x million bushels.

THE move to change Thanksgiving from Thursday to Tuesday for the benefit of the fishing industry, as recommended by Secretary Roper, fills many a pious soul with righteous indignation and an irrepressible desire to orate on the sanctity of American institutions. Nobody has, as yet, developed high blood pressure over the proposal; but soon we expect to hear a paraphrase of that classic legend which tradition says came from the Congressional Record

—"What! Change the name of Arkinsaw!! Hell's fire, NO!!!" Of course, you remember that famous declamation, so dear to young men of 30 years ago.

Confidentially speaking, however, one very astute and serious person has urged us to castigate, excoriate and romp all over the idea of Thanksgiving on a Tuesday. But Thanksgiving Day is too far away for us to get "het up" about it and furthermore we happened to have done some reading on the origins and history of holidays. If you possess a mean disposition given to debunking current beliefs you will find plenty of good ammunition in any good treatise on holidays, festivals, and celebrations.

What has Santa Claus to do with the birth of Christ? Why do little girls say it with flowers on May Day, when communistic organizations say it with pineapples? What have pumpkins and cornstalks to do with mirrors, lovers, bobbing for apples and bonfires, ghosts and overturned privies on October 31? To those who enjoy living in a fairyland of myth let it be recalled that "Where ignorance is bliss, 'tis folly to be wise."

Business Has the Ball

BUSINESS is meeting the challenge of the times with admirable spirit. A nationwide survey conducted by FOOD INDUSTRIES has failed to reveal a single case where there is contemplated any deviation from existing standards of employment or conduct of business. In only one case was it foreseen that in the distant future there "might be some need for slight readjustments."

However, it is not enough that business refrain from rocking the boat, excellent though that policy may be. Upon business rests the further obligation of actually creating recovery by aggressive action.

Although a technical publication like FOOD INDUSTRIES theoretically has no part in the political scene, we recognize very clearly that important history is in the making at this time. The New Deal plan of centralized control of all industry has been temporarily restrained through the action of the Supreme Court. The New Dealers are angry. The Administration is vindictive. The President himself momentarily dropped his mask of joviality and revealed something of the obscure inner workings of his mind. Very recently he has announced that the $4,000,000,000 spending program is to be diverted away from "costly" undertakings to the easy jobs where the dollars spent will go largely to direct labor (where it will have the greatest political benefit). All of this despite the fact that the unemployment is greatest in the industries producing goods (machinery, tools, and production facilities). No permanent re-employment is possible until there is a revival of production in the capital goods field yet, with $4,000,000,000 to be spent to promote recovery, the Administration has taken a course that will not relieve depressed conditions in those places where it is most acute. Why should this occur?

It is all too apparent that the Adistration's costly social experiments cannot be vindicated if recovery takes place in spite of the death of the Blue Eagle. Politically, it would be far better for the Administration to be able to point to a further slump in business in 1936 than to see real recovery set in from the day the Supreme Court made its famous ruling. And business should never forget for one instant that any President has it within his power to prevent a return of confidence by a few carefully worded remarks or evasions. Hence we say that it is up to business to bring back recovery in spite of the Administration.

Business is on its own today. Adequate financing is available right now. If money is needed it should be borrowed before Title II of the new banking bill becomes effective. The greatest contribution to recovery which those engaged in food manufacturing can make is the purchase of machinery and equipment wherever it can be found to be a profitable investment. FOOD INDUSTRIES has preached modernization for profit ever since it has been in existence. That policy is a very sound business

Hors d'Oeuvres

• "Why is coffee ever packed in expensive cans anyway?" asks a company which recently adopted paper bags. Here's the concern's answer: "In an attempt to artificially preserve freshness. Some coffee may be months old when the consumer gets it." Said company must have reformed!

• *"Swat the rooster" is the slogan of egg packers in Nebraska. It seems that this bird doesn't know any more than to fertilize eggs in the summer, causing them to be low in quality and off in price.*

• What is believed to be evidence of the world's first brewery has been discovered in the ruins of a city which existed 5,700 years ago in Northern Mesopotamia. A clay seal impression shows two "brewmeisters" stirring the contents of a large vat with long poles. This ought to make old timers in the brewing industry feel like yearlings.

• *Here's a practical tip for bum bakers and brides. A scientist at State College of Washington has discovered that charred apple pies make an activated carbon with commercial value.*

• After many months of use, numerous trips to the hoop-tightening machine and repeated pitching, the standard 15½-gal. beer keg sometimes shrinks to 13½ gal. No wonder brewers like wooden kegs!

• *An idea for cheese manufacturers: A limburger-filled golf ball which may be located easily when lost.*

• It pays to advertise—if you do it intelligently. A survey reveals an unfavorable reaction to ads dealing rudely with delicate subjects. One large advertiser was 98 per cent in the unfavorable column. Food manufacturers, incidentally, outranked all others in favorable reaction.

• *Definition: A bacteriologist is a man who thinks in terms of millions.*

• Politicians and economists are something like magicians. Their tongues are quicker than the brain.

• *An order from an ad run in a woman's publication in 1904 recently was received by Welch Grape Juice Co. It took some lady a long time to get fat.*

• An Ohio confectioner reports a decided upswing in orders for fancy candy packages. Maybe prosperity really is here. But then, perhaps the maidens are more popular this season.

Tests of this kind come frequently from Colgate University where Donald Laird is professor of psychology. Rumor has it that he is the only chemist who ever turned psychologist. He is the chap who showed by scientific methods that coffee makes you sleep better. Standard Brands used the story in Chase and Sanborn advertising until they found that Laird made his tests on Beechnut coffee. In this scene two subjects are eating a light lunch before being tested on their speed of thought association. There is a slight suspicion that a heavy lunch makes one dopey but in view of the coffee incident one cannot be certain who is behind that bit of folk lore.

policy. But there is a further reason for modernization today.

We must forestall, by a further business recovery, any move toward a constitutional amendment that will wipe out the functions of the Supreme Court or bring Socialism, State Capitalism or Fascism to the United States. The backlog of obsolescent equipment throughout all industry is enormous. A survey by *American Machinist* shows that 70 per cent of equipment is over ten years old and can be modernized profitably. The times call for generous spending.

Can Buy Equipment on Installment Plan

FEDERAL Housing Administration is now empowered to insure loans up to $50,000 for "purchase and installation . . . of such equipment and machinery with or without structural changes in the buildings, as are peculiarly adapted to the business therein or necessary to the operation thereof."

Manufacturers who need credit can thus get it direct from Federal Reserve Banks as a time loan or via F.H.A. on the installment plan. Loans under F.H.A. plan are repayable in monthly installments. The rate of not more than $5 discount per $100 face amount. *If you can get the money at a cheaper rate under this plan it is entirely between you and the lending bank.* All that F.H.A. does is guarantee 20 per cent of the amounts loaned.

FRB to Loan $200,000,000

THERE is no excuse for lack of credit in industry today. Ever since June, 1934, the Federal Reserve Banks have been empowered to loan direct to industry—a fact that has escaped the attention of nearly everyone. Any established manufacturing business is eligible to borrow this money at 6 per cent, for up to five years, for any purpose such as modernization, betterments, or working capital, except to pay off old loans. The only string on the proposal is that old creditors, if any, are asked to subordinate their claims to any new FRB loan.

These loans require either endorsements or collateral or both, have no minimum or maximum, the largest to date being $6,000,000 to a large motor car manufacturer. If management cannot secure adequate banking accommodations locally the next step is to apply to the regional Federal Reserve Bank. Final action can be obtained in from three to four weeks, quite a contrast to the months of waiting for action sometimes met elsewhere. Any business that has any real reason for credit can get it.

Food and Drug Bill

THE Copeland Bill, S.5, with amendments, battle scars, and revisions is now in the House. Although multiple seizure is out of the bill it has teeth, for any person who violates any of the prohibited acts shall be guilty of a misdemeanor and on conviction shall be subject to imprisonment for not more than a year or a fine of not more than $1,000.

On the whole, it is a good bill, and FOOD INDUSTRIES hopes it will be enacted promptly.

Labor Problems Ahead

THOSE on the inside know that the governing body of the American Federation of Labor is composed of almost equal numbers of conservatives and radicals. When NIRA was declared unconstitutional, that body held a meeting to decide on its future course and voted by a majority of a single vote to demand a constitutional amendment to legalize the theory of old NRA and to continue to call important strikes all over the country to force unionization of all plants. After that vote, William Green came out with his threats of nationwide strikes and disaster.

The conservative element, which wanted to build on local membership, lost control by the narrowest possible margin. Senator Wagner's labor disputes bill ties in with the trouble-making element and will perpetuate and foment further industrial strife. It is one of the ways by which recovery may be held back.

Every reader of these words should instruct his senators and representatives to kill the Wagner bill if it has not already been enacted. And all industry should develop a policy by which payrolls will not be reduced. To drop employees or reduce their weekly wages will be a fatal error. To defeat the radicals of A.F. of L. will be possible only by keeping wages and employment up and making hours flexible. Otherwise, A.F. of L. will dominate the country.

Correction

WE ARE asked by Otto Rahn to point out that he referred to the German concept of bran, in his article on Stable Bran Flour on page 171,

April, 1935, FOOD INDUSTRIES. In Germany the outer 25 to 30 per cent of the wheat berry is regarded as bran. In the United States the term is limited to the outer 8 per cent.

Those AAA Amendments

THE NRA fiasco notwithstanding, the Secretary of Agriculture still demands more power under the guise of "clarifying" amendments to AAA. He wants to be able to dictate to industry how much it can use and what prices it must pay for agricultural raw materials. Under H.R.8492, however, many of his desires have been withdrawn, for canners of fruits and vegetables have secured exemption — temporarily at least. Still subject to imposed allocation and license are milk, fruits and vegetables not used for canning, pecans and walnuts, soya beans, and naval stores.

Although the bill may be passed or altered before these words reach our readers, all are urged to follow it, to take proper care to safeguard their own interests, and to be on the lookout for joker clauses.

Inflation Traffic Lights

FOR the moment we wish to talk to top executives about inflation. The big question is, When will it come? Men of broad business experience realize that inflation could come at any time under current conditions. The only thing preventing the development of inflationary price rises right now is that the people still have confidence in their currency and their government's promises to pay. Once that confidence wanes we will see a flight from currency into things, goods, commodities, real estate.

Inflation, if it comes, will come gradually. In Germany 90 per cent of the value of the mark was gone before the people realized what was happening. In this country, our benevolent New Deal has shot out most of the traffic lights by which businessmen usually orient themselves. However, two traffic lights still remain which an executive of average training can spot.

The first one of these will disappear if the proposed banking act goes into effect unchanged. This traffic light is the way that government debt conversions are accepted. If Secretary Morgenthau wakes up some morning and finds that, under the present banking laws, a lot of a new issue of government notes or bonds is left on his hands, just then we will be aware of the beginning of lost confidence. That will be the red light that anxious men are looking for but hope they will not see.

The other traffic light is the value of U.S. dollars in terms of foreign currencies. But it represents the opinions of citizens of other countries about our domestic situation—not our own opinion of the future of our own affairs.

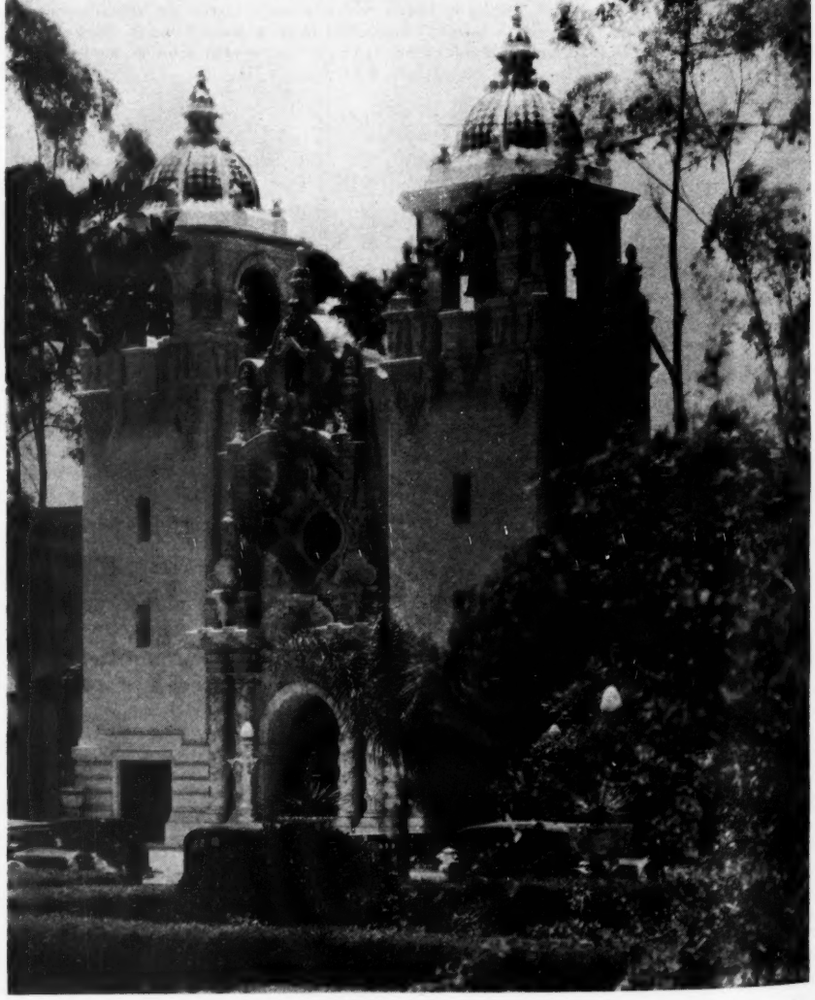
As long as our own confidence holds we cannot have any marked inflation, for it will be only our own distrust of our own currency and the ability of government to repay its debts that will touch off the fireworks—not what foreigners outside the country may think. Everyone hopes that the day of lost confidence may never come. But keeping or losing that confidence depends largely on the decisions of one man, who lives at No. 1600 Pennsylvania Avenue, Washington, D. C.

New Job for Research

ABOUT every so often we hear of a sort of problem relative to package specifications that shows us that packaging as a protective function is still in its formative stage despite a growing belief that, on the artistic design side, packaging has begun to wear long pants, talk bass and shave.

The problem arises today because so many firms are finding that rising costs make it imperative to cut the corners wherever possible. The package itself inevitably comes under scrutiny and somebody proposes the use of a less expensive package.

And then ensues a squabble about its effectiveness. Will a cheaper form of protection actually protect? All too frequently nobody knows and, if the management takes the proposal at all seriously, it is necessary to start a long series of tests under controlled laboratory conditions. Such tests



This imposing entrance to the Palace of Beverages and Foods at the California Pacific International Exposition, San Diego, leads to "more foods and beverages than have ever been shown at any exposition in the world"! It opened May 29.

often require months for their completion. Moreover, if management has ever had its fingers burned before, it is certain to demand a practical test in the trade before approving a package change. And that takes some more months.

An alternative to that procedure would be to have the research department develop the necessary information regarding every product, either existing or contemplated, so that maximum and minimum specifications for a package are known in advance. The data would cover: dimensions. shapes, thickness, strength, chemical composition, light-, moisture-, air- and insect-resistance, colors, corrosion resistance, protective coatings such as enamels or lacquers, fumigation possibilities, adhesive, finishes, possible changes in formulas or manufacturing procedure that might be entailed. All of these and perhaps many more factors should be available to every production manager, together with cost analyses. But to be complete, the investigation should be supplemented by tests to show how long several given forms of packaging will maintain the goods in merchantable condition in various climates, under average prevailing conditions, as well as maximum adverse conditions.

Sometimes management does not want to change its package at all, and perhaps properly so. Occasionally, however, competition compels prompt action. If the data is not available "day before yesterday" then it may be necessary to make price concessions to hold the trade while research is being pushed frantically to discover what can be done and how it can be done. Such a research is a sound insurance against unnecessary losses.

Standard Brand's new plant for Fleischmann's Yeast at Oakland, Calif., is a thing of beauty and, for the sake of the operating force, it is hoped it will be a joy forever. It ought to. It cost a million and a half.

Across the Fence—Mayonnaise

NOTHING short of astonishing is the large number of letters that have come to the editors during the past six months asking for complete information about formulas, equipment, manufacturing procedure and personnel from people who want to go into the mayonnaise business.

It is true that we enjoy all forms of contact with our readers, but in this instance we find that the pleasure is somewhat lessened because we conceive it to be only right that we should point out the discouraging features of the business when giving part of the desired information.

To those who know no more about mayonnaise than they can acquire in a letter, we reiterate a statement made over a year ago. We believe that the mayonnaise business is a swell business for the novice in food manufacture to stay out of.

Successful mayonnaise production is erroneously regarded by many as but a step removed from a household industry. Would-be entrants into the industry should be reminded that mayonnaise left the household kitchen ten or twelve years ago.

More Troubles

TOMATO products manufacturers have but a very short time in which to prepare for a possible new form of trouble during the coming season. It seems that the corn ear worm has been discovered to be able to get inside a growing tomato, and the ripe fruit often fails to disclose its presence through any tell-tale blemishes.

The Food and Drug Administration has developed a microscopic technique to reveal the presence of parts of the worm in tomato products and is applying it in the field this year. A few seizures have been made on 1934 products.

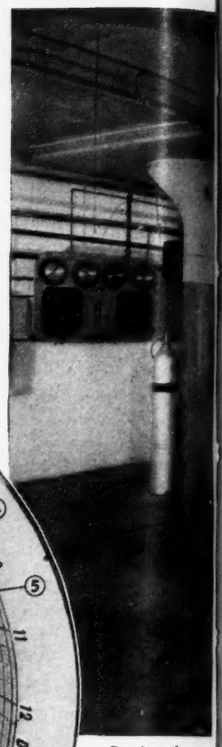
No manufacturer will condone the presence of worms in any product. Every effort will be made to keep them out. But up to now there appears to be no way of discovering when a tomato is wormy, short of coring it. To cut the core out of every tomato will be a very costly operation, yet there seems to be no other way. Trap-crops of sweet corn may offer some help in future years, but it is too late to plant them in time to do any good in 1935. Spraying or dusting the tomatoes on the vine may prevent the attack by worms, but it is a remedy that will require further factory treatment to get rid of the spray residues.

About the best advice we can give at this moment is that manufacturers must study the problem in their tomato fields and find out if the tomatoes have been attacked before they reach the factory. Further, it is well to keep in mind that there is no legal tolerance for worms. More information is given elsewhere in this issue.

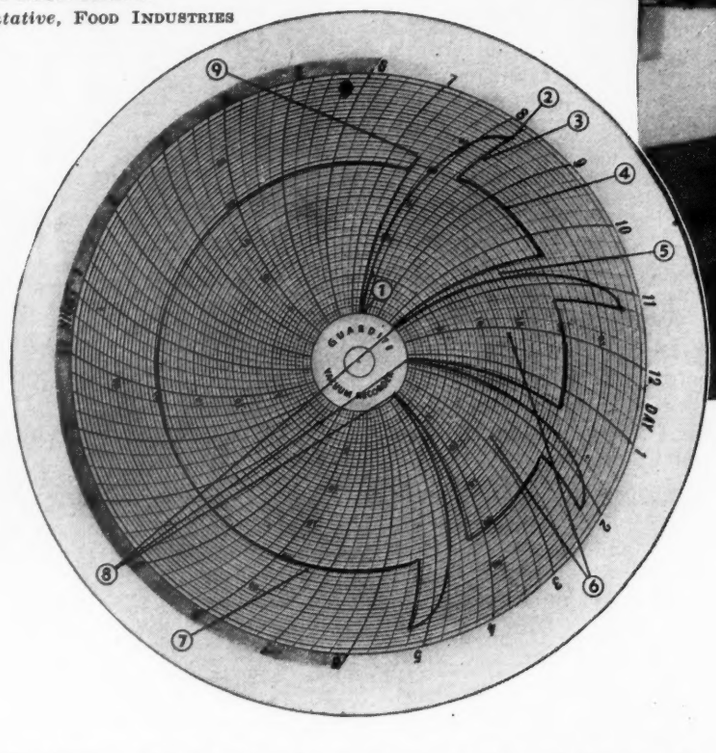
Vacuum Fumigation

By using effective chemicals in vacuum chamber insect pest control is accelerated

By R. S. McBRIDE
Editorial Representative, FOOD INDUSTRIES



Courtesy of Guardite Corp.



Typical Guardite recorder chart taken in food products fumigation operation. 1, starting time, 7:30 a.m. 2, chamber exhausted to 28.5-in. vacuum. 3, gas introduced. 4, treatment period of two hours. 5, vacuum pump operating and breaker valve opened simultaneously, providing an air wash of the goods. 6, similar treatment cycles. 7, last lot allowed to stand overnight. 8, door opened, goods removed and a new lot placed in the chamber. 9, vacuum pump started before breaker valves were opened, accounting for the rise in vacuum here.

FOOD fumigation for the control of insect pests requires adequate contact of effective and safe fumigant materials. All forms of insect life present must be reached and killed; but no damage to the food must occur, whether it be raw material or finished goods. A variety of processes meet these requirements and various chemicals are adequate and safe; but for many conditions of food-plant operation the vacuum process is most economical and sure.

For the present discussion it will be assumed that a suitable choice of fumigant chemical has been made and that the material to be used is mixed with carbon dioxide in proper proportions so that neither fire nor explosion hazards will exist. Later, in FOOD INDUSTRIES, another article will discuss the question of what gases and what concentrations of each are needed for some of the important foods which have been successfully treated. In the present article those phases of the subject will not be considered.

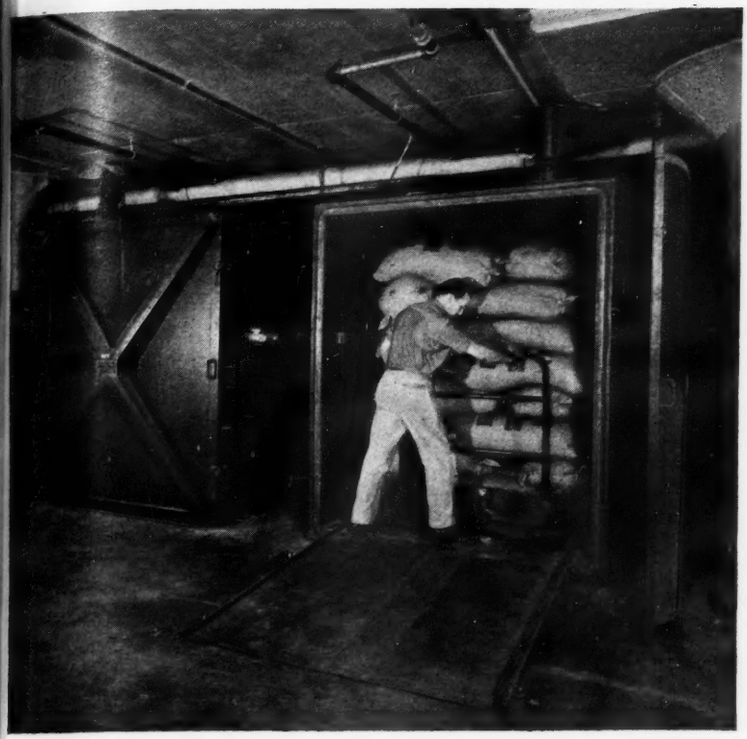
Effectiveness of fumigation for any particular insect in any particular food changes with a variety of conditions. However, for all combinations the kill is quicker and more complete to the extent that the respiration of the insect is stimulated.

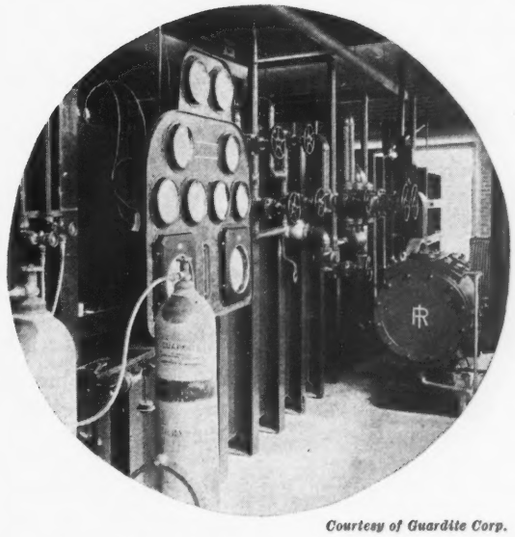
Such stimulation may be achieved by lowered oxygen concentration, increased temperature, increased concentration of carbon dioxide, or any combination of these three factors. Vacuum processes have the advantage that they can both decrease the absolute concentration of oxygen and increase the ratio of carbon dioxide to oxygen, thus occasioning a double stimulation to the insect.

Penetration of the foodstuff by the fumigant is, of course, also of first importance if the toxic material is to reach every insect at all stages of its life history. Atmospheric pressure fumigation requires that penetration be achieved mainly by diffusion of the fumigant through the mass to be treated. Vacuum processes permit a speeding up of the penetration. The penetration of the fumigant to the innermost parts of the treated mass may be so accomplished in a small fraction of the time that would be necessary if only diffusion at atmospheric pressure were functioning to accomplish this result.

Since the effective time to secure a kill really begins only after the fumigant has reached the most deeply buried insect life, the practical operating time is reduced, and the capacity of fumigation apparatus increased, just to the extent that delay in penetration of the mass by the fumigant is eliminated.

FOLLOWING fumigation, goods should be storable more or less indefinitely without insect damage, assuming only that there be protection against reinfestation. Only when the kill is complete is fumigation satisfactory. It is not proper to assume that a 75 or 95 per cent kill is satisfactory, even though it might be beneficial under some circumstances. Furthermore, the kill must be complete





Courtesy of Guardite Corp.

Above: Gas handling and control equipment, showing instrument panel and control valves.

Left: Dual chamber installation of the new rectangular type of fumigation chambers, with overhead hinge mounting of doors.

with respect to all stages of insect life, from egg through larva to adult. Usually this latter consideration is more important in determining the choice of the fumigant than in selection of the process; but it is also somewhat significant here because of the advantage of vacuum methods in reaching eggs and buried larvæ.

Vacuum and atmospheric processes both require housing the material to be treated in such a way that temperature, concentration, and time of exposure to the gas may be accurately controlled. These factors are importantly interrelated. With the increase of any one of them, the completeness of the kill improves until perfect. It is, therefore, a matter of economics for any particular food material to determine whether it is more important to use higher concentration, higher temperature, or longer time of exposure, in the effort to get lowest processing cost.

Equipment for vacuum fumigation is comparatively simple in form and operation. The treating chamber is essentially a cylindrical or rectangular chamber of a size appropriate to the goods to be fumigated. Mechanical facilities for loading and unloading by means of convenient trucks should be arranged. A means for heating the vacuum chamber and its contents is desirable.

Early equipment for vacuum fumigation utilized cylindrical treating tanks, because of the simplicity of construction; but more recent installations have employed rectangular tanks. Usually merchandise to be fumigated is best handled in a rectangular load on a four-wheel factory truck or skid. Loading of such units seldom uses more than half the available cubic space in cylindrical vessels; but from 75 to 90 per cent of the available space can be employed with rectangular treating chambers. This not only increases throughput per unit of capital investment, but also minimizes consumption of fumigating gas per ton of goods treated.

Occasionally a special flooring, track, or rack holder should be built into the vacuum chamber to accommodate the goods to be treated. With cylindrical chambers, floor or track is always needed. For general fumigation uses in a plant processing a variety of goods, it is desirable, however, that these be accommodated on hand trucks or skids of standard size that fit the chamber. Thus any raw material or finished product may be processed in cases, cartons, barrels, bags, or other container most convenient for the particular material.

The chamber closure must be by means of vacuum-tight doors, preferably so counterbalanced as to be easily handled without accessory mechanical facilities. Doors may be provided at one or both ends of the chamber, depending on the material and the method of handling best suited to the individual plant being served.

For lowest installation cost one-door chambers are employed; but two-door through-type units are preferred where untreated material is in one room and fumigated material should be discharged into another room. In this case the fumigating chamber has the partition wall placed around the body of the tank. This arrangement is especially desirable where there is danger of infestation traveling from the receiving room into the storage space or plant.

Fumigating chemicals commonly used in food plants are received in high pressure cylinders from the chemical manufacturers. These cylinders are attached, generally in multiple, to a manifold with appropriate gages, valves, and other control facilities.

AN accumulator is provided of suitable size to hold at 75 lb. pressure at least enough of the fumigating gas for one tank treatment. The fumigant is released from the high pressure cylinder in which it is received, into the accumulator, where it is vaporized, with heating coils if necessary, so that a homogeneous uniform mixture will be ready at the proper temperature.

The treating chamber is exhausted by means of a vacuum pump of capacity and efficiency suitable to pro-

duce at least a 29-in. vacuum within fifteen minutes. The type of pump preferred depends somewhat on the capacity of the chamber. Generally, a rotary oil-seal pump is used only for very small chambers; a 2-stage reciprocating pump is preferred for all the larger sizes.

Suitable safety devices to control excess pressures and prevent other mechanical hazards have been developed. The equipment pictured in the accompanying illustrations has been critically studied by the Underwriters' Laboratories of Chicago. This impartial investigation insures that every reasonable and necessary means has been taken to prevent either fire or personal danger.

Operating cycles vary according to many individual plant conditions. In general, however, they follow a simple plan. As soon as one batch of material has been finally treated and given its air-wash, the doors are opened and goods on the treating trucks removed. A new charge is at once introduced and the doors closed. The vacuum pump is started and the chamber exhausted to approximately a 29-in. vacuum. A precalculated dose of treating gas is introduced from the accumulator with the control by the operator in accordance with pressure indications of the gages on the operating panel.

After an appropriate interval of exposure to the gas, the fumigation is complete. The fumigant is then removed by the pump; the goods are given an air-wash, by pressuring through the breaker valves and re-evacuation with discharge of the rinsing air to waste. The chamber is then ready to be refilled with air for opening and discharge of the goods.

The total time for such an operating cycle can be made shorter if the concentration of chemical used is increased. Usually, however, it is not economical to make the total period between one charge and the next less than three and a half to four hours. This affords approximately a three-hour period for exposure of the material to the chemicals after the completion of repressuring before the air-rinse begins. With such an operating cycle of four hours, a single nine-hour shift accomplishes treatment of three batches per 24-hour day. Two normal three-hour treatments are handled, followed by a third batch given a lower concentration of gas and allowed to remain in the treating chamber overnight.

This operating plan not only minimizes labor cost, but has the advantage of giving surplus treating capacity which can be used in peak-load periods by adding a second shift of workers. With a dual-chamber installation it provides fumigation for six charges per shift. It is uneconomical, however, if the quantity of goods to be treated at one point in a plant is so great that several complete operating units would be required for use with it. Under those circumstances it is often better to operate two or three shifts per day, assuming that the other operations of the plant are so conducted, than it is to add a second or third complete fumigating outfit. In some plants, fumigating chambers may be placed at various points in the works to care for different materials. This saves rehandling or hauling of material excessive distances within the plant.

Chemical control of the process operation is not essential. Advance determination can be made of the quantity of gas to be used for any particular sort of product requiring fumigation. Charts of calibration then indicate quantities of gas which have been applied merely by the pressure readings of the indicating instruments.

AS a permanent file-record of operations, a 24-hour recording pressure-gage chart is made. Since the dosage for any particular kind of material can be determined in advance, such a pressure chart constitutes a permanent record of actual fumigation accomplished. Also it is a valuable record of the carefulness of operation by the attendants, facilitating management supervision of this work.

Cost of fumigation varies somewhat with the type of goods treated, character and size of packages, and the total volume of material handled. Typically, using a mixture of ethylene oxide and carbon dioxide, the total operating cost ranges from 60 cents to 80 cents per ton of material processed. These figures assume that the plant is so installed relative to other facilities for handling the material that the goods are readily loaded on treating trucks, either from storage space, freight car, or production department, and that they can go from the fumigating department into storage or shipping without excessive rehandling.

The tabulation on this page shows the range of sizes of units commonly employed in food plants, and the type and capacity of auxiliary facilities suitable for use with them. From the over-all dimensions indicated, it will be clear what floor space is needed; and from the weights it will be evident what floor loads must be provided for.

THE cost of initial installation varies largely with the size of equipment and somewhat with local plant conditions. In a number of cases, the half-carload units have been completed for less than $4,000. Units of 100 cu.ft. cost less than $2,000. Total investment usually ranges from these figures up to $10,000 with the largest unit commonly needed in food-plant operation. The largest installation yet built holds six standard railroad box cars per charge; but this unit would not often be of an economic size. In view of the fact that large tonnages can be handled per year through even the smaller unit equipment, the capital cost per ton of goods is usually only a small fraction of the operating expense.

In any event, the cost for fumigation of infested food-stuffs is a trifle in comparison with the losses that are likely to occur without treatment. Frequently, the increase in prestige and the improvement in customer relations is more than enough to make fumigation of either the raw material or the finished goods an economic necessity.

Capacity of Treating Unit for a Typical Rectangular Equipment for Vacuum Fumigation

	One-half carload	One-carload dual unit	One-carload single unit	Two-carload dual unit
Size of treating tank*	6′6″x8′x26′	6′6″x8′x26′	6′6″x8′x52′	6′6″x8′x52′
Inside tank dimensions*	5′6″x7′x25′	5′6″x7′x25′	5′6″x7′x50′	5′6″x7′x50′
Vacuum pump, size	18x7	18x7	22x9	22x9
Motor (horsepower)	20	20	30	30
Accumulator (if vertical)	3′6″x9′	3′6″x9′	3′6″x9′	3′6″x9′
Accumulator (if horizontal)	2′6″x18′	2′6″x18′	2′6″x18′	2′6″x18′
Weight of tank (tons)	10	20	18	36
Weight of pump and motor (tons)	1.75	1.75	2.75	2.75
Weight of accumulator (tons)	1.12	1.12	1.12	1.12

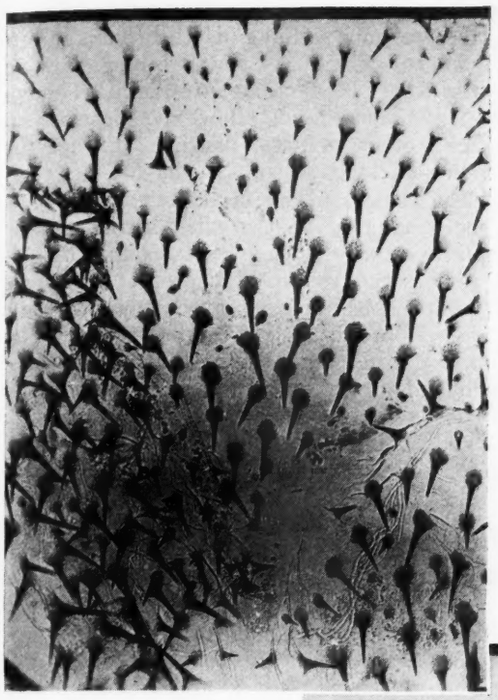
*Overall width by height by length.

Courtesy Guardite Corp.

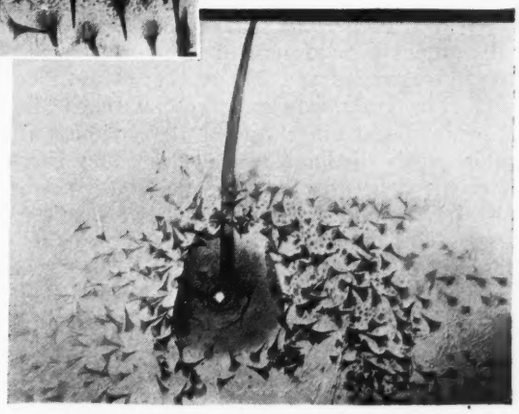
A Preliminary Note Regarding the Occurrence and Detection of the

Corn Ear Worm in Tomato Products

By B. J. HOWARD
Chief, Microanalytical Division
Food and Drug Administration
Washington, D. C.

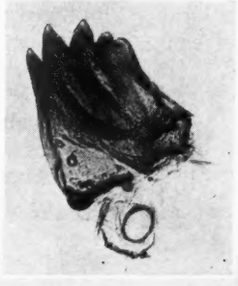


Fragment of skin of corn ear worm showing fine surface spines. x150

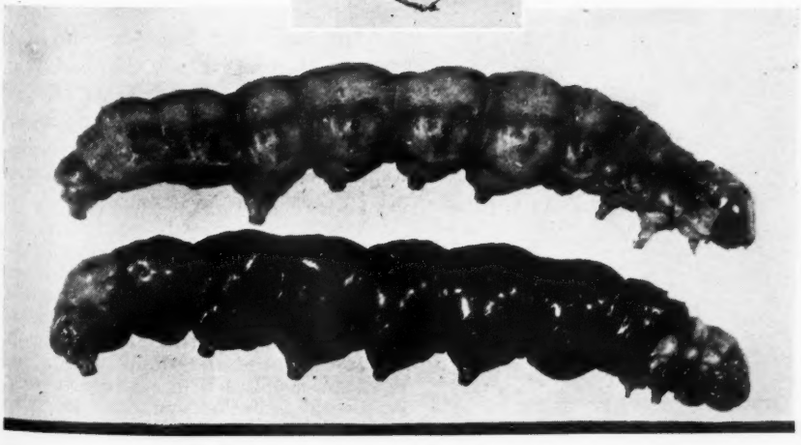


Fragment of skin with seta (hairs) broken loose from it, and fine spines which are abundant on the surface. x80

True foot from corn ear worm. x45



Mandible from corn ear worm. x85



Corn ear worms from tomatoes. x4.
(Figures in captions refer to diameters magnification.)

EARLY in September, 1934, the Food and Drug Administration received telegraphic reports announcing that a bad condition had been encountered in the tomato crop of certain western states resulting from a heavy infestation of "worms" in the fruit. The writer hastened to investigate the situation and cooperate with members of our Western District and of state offices. The present article must be regarded only as a preliminary report calling the attention of members of the industry to the condition encountered and emphasizing the need for alertness in coping with it in their own districts should infestation occur in the future.

The insect causing the trouble proved to be the corn ear worm (*Heliothis obsoleta* Fab.) also known as the tomato fruitworm and the cotton boll worm. The nearly mature larva of this insect may reach a length of 1½ inches. Individual worms vary in color, often to the extent of leading the layman to wonder if they are really the same species. Tomato fruits become infested by the adult females laying eggs on the tomato plant. After hatching, the young worms move about the plant feeding to a slight extent upon the leaves. When they encounter the developing fruit, they crawl under the calyx and burrow down into the core, where they carry on most of their feeding operations, or they may only cut small feeding holes around the calyx, or on the sides of the fruit. The worm may remain in the tomato until mature, or after feeding for a short time may move to another

fruit. One worm then may be responsible for injury to several tomatoes. The feeding holes in the tomato permit the entrance of decay organisms and often these decays complete the injury started by the worms. In cases where the worms feed within the tomato until fully developed, such tomatoes, when opened, reveal a disgusting mass of worm excreta with the insect itself frequently present.

The use of such material in tomato products renders them filthy and, therefore, adulterated under the Food and Drugs Act. At the outset, from a regulatory standpoint the detection of such material in products such as catsup and puree presented such difficulties as to make necessary considerable preliminary study and experimentation, since in such products which have been pulped, the insects, if found at all, could only be expected to occur in small, torn fragments. After considerable experimentation the method found to give the most satisfactory results was one devised originally by Mr. J. D. Wildman, of the Microanalytical Division, for the recovery of small insects from certain food products. In its application to this particular problem, only minor additions were found advantageous. Although certain improvements and refinements are being introduced from time to time to make it more effective, the following abridged description of the method as now used will give a general idea of its operation though, for a more detailed description, request should be made to the Food and Drug Administration, U. S. Department of Agriculture, Washington, D. C.

A one-hole, rubber stopper, which is of such size that it will just pass snugly down the neck of a 2-liter Erlenmeyer flask, is pushed down to the bottom of such a flask by means of a small supporting rod fitted into the hole of the stopper. Two hundred cubic centimeters of the product to be tested (100 grams in the case of paste, mixed with 200 cc. of water) is placed in the Erlenmeyer flask and 20 cc. of gasoline added and the mixture shaken. Then water at room temperature is added in such fashion as to vigorously agitate and mix the whole combination thoroughly until the flask is filled up into the constricted neck. The flask is allowed to stand for a few minutes, during which time the contents are very gently rotated by means of the rod and stopper. In this manner the insect fragments are brought to the top with the gasoline. The gasoline layer and a shallow portion of the aqueous layer is then entrapped in the neck of the flask by raising the rubber stopper until it fits snugly in the lower end of the flask neck. (See Fig. 1.) The entrapped portion above the stopper is poured out into a quick action filter paper in a suction Buchner funnel. After the liquid portion has been drawn through, the residue retained on the filter paper is examined under a low power, wide angle, Greenough type microscope giving magnifications of about 10 and 20 fold. The fragments of insects are located and identified and their number noted. As a foundation for this determination the analyst should familiarize himself with the appearance of the characteristic structures of the insects through examination of larvæ of known authenticity.

By means of this method there have been recovered from some commercial samples a maximum of over 100 larval fragments per 200 cc. of product. The fragments most commonly encountered are those of the skin, quite easily distinguished by the characteristic structures on them such as seta (hairs) and small spine-like processes. Not infrequently, various mouth and skull fragments are found as well as the true and false feet in whole or in fragments. Spiracle openings, the breathing pores located along the sides of the insect, are also not infrequently encountered.

The survey revealed that the infestation varied greatly in different parts of the same state, in some localities running as high as 25 per cent.

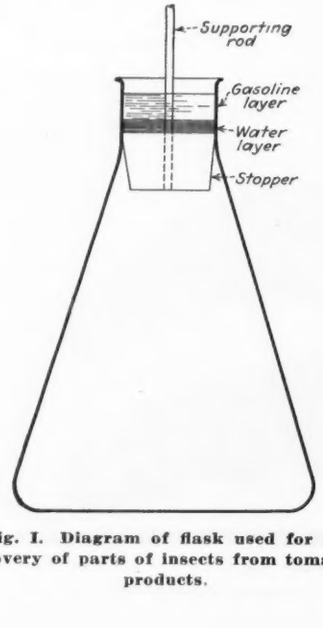


Fig. 1. Diagram of flask used for recovery of parts of insects from tomato products.

Later, hurried surveys were made in certain sections of other states in one of which a lot was found showing over 30 per cent infestation. Though time did not allow investigations in other tomato districts during the packing season, we have found evidences of insect infestation in some samples made in other sections of the country. This indicates that the insect was probably present in appreciable numbers in tomatoes in some localities other than those specially visited, though most of the samples from these districts showed only traces of infestation.

Fortunately outbreaks of the corn ear worm on tomatoes are sporadic and are quite often centralized. No satisfactory control measure has been developed for this pest. Dusting with calcium arsenate will reduce the injury to about 50 per cent over untreated areas. However, in order for such treatments to be effective the arsenical must be applied early in the season and in such a manner as to reach all portions of the plant. Obviously if the worms enter the fruits they cannot be reached with a stomach poison; consequently, any control measures effected must take place before the worms enter the fruit. In cases where the calcium arsenate is employed, the spray residue hazard must be kept in mind and any tomato fruits which have received an application of poison should be carefully washed.

From the packer's standpoint, he must see to it that such means are employed as will eliminate the worms and infested portions of the tomatoes. From the observations made last season it did not appear that there was to be much trouble with canned tomatoes, since in this case it is the general practice to remove the cores in which most of the objectionable condition is located. The only questionable cases observed were those in which the trimmers had failed to cut deep enough to remove all the bad portions. Because of the difficulty of detecting evidences of the insect from an outside inspection alone, some of the packers adopted the practice of coring every tomato.

It is absolute folly to try to make acceptable products from infested stock without the closest inspection under the best of conditions as regards volume of stock handled, evenness of dumping on the sorting belts and ample sorters and trimmers supplied with efficient lighting. As already indicated, some packers, even under such conditions, felt the only safe way was to require the coring of each tomato.

Sales Accounting
for Meat Packers

Sales and distribution cost accounting should take its place alongside of production cost accounting, thereby completing the cost picture

By A. WEISS
Chicago, Ill.

Based on an analysis of the operations of a large meat packing company for a period of one month, the following study is an example of the type of information with which management should be armed and the broad uses to which such analyses can be put.—The Author.

KEEN competition in the meat packing industry has resulted in two trends, each of which may be detrimental, namely: (1) Retailers spread orders over a large number of selling companies. It is contended that many of the resulting orders are too small to be profitably filled. (2) Price concessions are given to large buyers in order to increase sales volume. It is contended that this practice results in orders being taken at a loss.

The following examination of the costs of selling large and small orders will indicate to what classes of customers the packer can profitably sell and how unprofitable orders might be made profitable. It is based on a study of five routes of a large packing company during October, 1932. These routes were selected to cover as many different types of sales as possible.

The extent to which losses resulted from the very small orders (up to $20) and from small orders in general (up to $70) is shown in Table I. Note that the major part of the net loss of each route studied was made on the small orders, and in some cases more than the total net loss was made on the small orders, more than balancing profits made on large orders.

Smaller orders also incurred larger costs per pound, which were not sufficiently covered by the small increase in the margin occasionally obtained. This increased per-pound cost results from the higher cost of operating a salesman for the customer, which includes all expenses that vary with the salesman; invoice costs and item costs, including all expenses varying with the number of invoices or the number of items, are also higher per pound on smaller orders. Table II shows that salesmen, in general, do not (as is sometimes supposed) make up this increased expense on the smaller orders with increased margins.

To reduce these losses on small orders either or both of two methods can be followed. The first method involves establishing, as a basis for pricing, a differential so that the margin on small orders will cover the increased expense per pound. Table III shows a suggested differential based on the distribution cost per pound on various sized orders.

The other method involves reducing the expense per pound. This can be done in two ways: (a) By having salesman call less frequently, and spend less time when he does call, on customers whose orders are small, thus permitting him to handle more

Table I: Per Cent of Total Net Loss from Small Orders

Size of Orders (Cumulative)	Salesman A	Salesman B	Salesman C	Salesman D	Salesman E	Total
Up to $20	77.0	71.4	171.8	80.0	50.8	79.6
Up to $70	84.1	327.0	109.3	117.9	103.6	127.8

Table II: Showing Average Expense, Margin, and Profit by Size Classes for Five Routes

Size of Order	Expense Per Pound	Margin Per Pound	Excess Over Expense Per Pound	Pounds Shipped	Profit or *Loss*
0 to $5	$.026	$.016	*$.010*	4,822	*$50.95*
$5 to 10	.020	.014	*.006*	16,968	*97.21*
10 to 20	.018	.014	*.004*	43,464	*150.44*
20 to 30	.015	.013	*.002*	38,670	*79.22*
30 to 40	.014	.013	*.001*	39,849	*38.60*
40 to 50	.013	.013	....	30,617	*.72*
50 to 60	.014	.013	*.001*	20,477	*12.47*
60 to 70	.015	.009	*.006*	8,359	*49.60*
70 to 80	.011	.014	.003	12,412	44.62
80 to 100	.012	.012	....	16,464	4.19
100 to 150	.011	.011	....	17,665	9.51
150 to 200	.011	.012	.001	7,704	13.47
200 to 300	.010	.011	.001	17,745	30.07
300 to 500	.010	.013	.003	5,984	14.84
Over 1,000	.008	.013	.005	15,846	71.56

Table III: Suggested Price Differential

Size of Order	Price Differential Per Pound (cents)
Up to $5	0
$5 to 10	—¼
10 to 20	—½
20 to 50	—1
50 to 150	—1¼
150 to 500	—1½
500 and over	—1¾

Note: From the base price, the salesman may deduct the amount indicated above, depending on size of order. This will allow sufficient margin to cover costs and orders will not be sold at a loss because of unscientific pricing.

customers. (b) By the use of the price differential which will tend to make the retailer give fewer but larger orders, reducing invoice and item expenses; and will cause the retailer to tend to buy from fewer packers, thus decreasing the aggregate salesmen cost, invoice cost, and item cost for the industry.

Some may object that, if the above outlined course is followed, the retailer will transfer his patronage to another packer. This may be so; but it is better to risk losing a customer than to continue to sell him at a loss.

One advantage from the methods indicated is that more accurate profit and loss statements are obtainable than would be the case if, for example, indirect distribution expenses were applied on some arbitrary basis such as hundredweight shipped.

THERE is some difference of opinion as to whether the order or the account is the best costing unit in the meat packing industry; that is, should the differential be on the size of the account or the size of the order. It is argued that the salesman does not know the total amount that the customer will buy and cannot rescind his price once it is stated. It is also argued that the account is the unit dealt with, and that a packer cannot cut out orders without cutting out the whole account—that if the account is to be retained, all orders must be filled.

It would seem, however, that the best method of attacking the problem of unprofitable business lies not in cutting out unprofitable accounts, but in assuring a margin sufficient to cover expenses on all orders.

To argue that the salesman cannot offer lower prices for larger orders because he does not know the total amount that the customer will buy, is invalid. The salesman could quote his ordinary price and at the same time mention that if a certain size of order is given he will allow a certain amount per pound as a discount. The amount of the discount, the price differential, would be based upon costs.

Discounts could also be based on the size of the account, although that appears to be less desirable because the discount could not then be given at the time of the sale, the customer would have to trust the packer's accounting system and his good faith, and the system is untried and would be difficult to sell.

THE costs of distributing orders for the routes studied are shown in Table IV, which also includes a suggested price differential based on these costs.

Table V shows profit or loss in the various size classes for two of the salesmen. It shows that the major part of the net loss of each route studied was made on the small orders and in some cases more than the total net loss was made on the small orders, thus overbalancing the profits made on the large orders.

From Table V it is evident that salesman B incurred a large loss in the $10 to $20 class of orders, because of large expense per pound.

A breakdown of the expenses of salesman B would show that the large expense in the $10 to $20 class came from the item of $60.25 for cost of operating salesman. Unless the customers in the $10 to $20 class in that period were prospective large customers, or for some other good reason it was good policy to incur the loss, the salesman could be instructed to spend less time, make fewer calls or increase the size of orders in that class, in order to cut down this expense.

The profit and loss statement for salesmen A and B is shown in Table VI. This shows that A's ratio of cost of operating salesman to sales is much higher than B's, although B has a higher absolute cost of operating salesman. Also, A has a large percentage of margin to sales. From these two facts, the management could deduce that A should decrease his selling price so as to increase volume. This should increase net profits, notwithstanding the decreased margin.

The method of analysis here outlined furnishes a fair and correct

(Turn to page 364)

Table IV: Costs of Distributing Meat Orders and Suggested Price Differential

Size of Order	Cost Per Pound	Cost Differential Per Pound (cents)	Price Differential Per Pound (cents)
$5 or below	$.026	0*	0*
5 to 10	.020	— .6	— .5
10 to 20	.018	— .8	— .75
20 to 30	.015	—1.1	—1.0
30 to 40	.014	—1.2	—1.0
40 to 50	.013	—1.3	—1.25
50 to 60	.014	—1.2	—1.0
60 to 70	.015	—1.1	—1.0
70 to 80	.011	—1.5	—1.5
80 to 100	.012	—1.4	—1.5
100 to 150	.011	—1.5	—1.5
150 to 200	.011	—1.5	—1.5
200 to 300	.010	—1.6	—1.5
300 to 500	.010	—1.6	—1.5
1,000 and over	.008	—1.8	—1.75

*Base price.

Table V: Statement Showing Profits and Losses by Size Classes for Salesmen A and B

Class	Salesman A Expense	Salesman A Margin	Salesman A Profit or *Loss*	Salesman B Expense	Salesman B Margin	Salesman B Profit or *Loss*
$0 to 5	$.026	$.014	*$15.10*	$.024	$.031	$2.70
5 to 10	.025	.014	*38.72*	.021	.017	*9.94*
10 to 20	.019	.014	*46.75*	.022	.017	*26.74*
20 to 30	.015	.014	*6.20*	.016	.013	*30.28*
30 to 40	.011	.012	7.56	.015	.013	*26.97*
40 to 50	.014	.013	*3.47*	.016	.013	*19.45*
50 to 60	.017	.013	*6.65*	.013	.011	*19.49*
60 to 70	....	....	....	.018	.012	*25.46*
70 to 80	.008	.013	8.97	.012	.016	13.89
80 to 100	....	....	....	.015	.014	*7.92*
100 to 150	.009	.012	17.45	.014	.009	*23.35*
150 to 200	....	....	....	.011	.012	10.29
200 to 300	....	....	....	.010	.012	29.06
300 to 500	....	....	....	.010	.013	14.84
1,000 and over	....	....	....	.008	.013	71.56
Totals	$.017	$.013	*$130.07**	$.013	$.013	*$47.58*

*This includes loss due to expenses applied and no sales made.

Table VI: Profit and Loss Statement of Each Salesman

	Salesman A Amount	Salesman A Per Cent to Sales	Salesman B Amount	Salesman B Per Cent to Sales
Sales	$3,124.93	100.0	$11,711.12	100.0
Margin	454.82	14.5	1,409.07	12.0
Operating Salesmen	315.98	10.1	423.29	3.6
Freight	171.41	5.5	601.03	5.1
Drayage	.....	.....	174.83	1.5
Interest	11.51	.4	45.28	.4
Claims	6.51	.2	22.85	.2
Resales	1.05	.0	10.87	.1
Credit, per account	5.32	.2	3.69	.05
Checking, Loading, etc	20.60	.7	65.66	.6
Bad Debts	11.56	.4	39.93	.35
Invoice and Item Costs	40.95	1.3	59.12	.5
Total Expense	$584.89	18.8	$1,446.65	12.4
Net Profit or *Loss*	*$130.07*	*4.3*	*$47.58*	.4

Cocoa Bean Blends

By A. E. WILLIAMS
Manchester, England

▶ **Cocoa bean blending is such a debatable factor in chocolate and cocoa manufacture that controversies regarding the best practice do not recognize geographical or political boundaries.**

▶ **In the United States, chocolate of the light sweet, dark sweet, and milk types are widely manufactured by using only one kind of cocoa bean such as the Accra, the Bahia, the Sanchez or the Caracas. However, blends of several beans such as Accra, Bahia, and Sanchez are commonly used for the ordinary dark sweet chocolate. Careful roasting, grinding, and added flavoring will greatly improve the flavor of chocolate thus produced.**

▶ **Chocolate so prepared may puzzle the expert as the treatment of one blend of beans may be so controlled as to give approximately the same flavor as that obtainable from another blend. However, there is the limitation that the most successful blending and processing of cheap beans such as Accra, Sanchez, and Bahia have not equalled the results obtained from blends containing Arriba, Java, Puerto Cabello, and/or Maracaibo beans. This means that a good chocolate with a satisfactory chocolate taste can be made from cheap beans but a chocolate with an individuality, a mellowness, a uniqueness of flavor is obtainable only from the high grade beans.**

▶ **Also in the United States there is a strong demand for light-colored, mild, sweet, and delicate chocolate flavors in coatings. To complement this demand there is a type of chocolate user who desires strong, harsh, bitter chocolate, and another type who wants a sweet but very strongly flavored chocolate. For milk chocolates Accra, Sanchez, and Caracas beans are used to some extent; Ceylon, Java, and Samoa beans are used sparingly; and only for very high quality chocolates are Arriba, Machala, Maracaibo, San Felipe, and Puerto Cabello generally used.**

▶ **The flavor of bitter, harsh beans is often softened by a light Dutch treatment and then by blending with high grade natural beans to obtain a mild chocolate blend. Starch and dextrin are not used in the United States as the Federal Food and Drug Administration standards prohibit this practice. Dextrose is permitted but not widely used. The addition of 2 to 4 per cent of either whole or skim milk is often resorted to to produce a mild-flavored chocolate from cheap beans with a lower degree of sweetness than is possible by the use of sugar.**

▶ **These United States practices are cited in comparison with those reported by Williams to be customary in England.—*Editor.***

COCOA BEAN blending is carried out primarily with a view to improving the flavor of the chocolate, and it is seldom that any type of chocolate is made from a single species of cacao (cocoa beans). Also, blending frequently results in lowering the cost of the raw cacao. In many instances it is found that instead of using a large proportion of expensive cocoa beans having the special properties desired, a similar result may be obtained from the combined use of several varieties.

In the blending of nibs for plain chocolate manufacture, the chief results desired are both a deep brown color and a pronounced chocolate flavor tending in many cases to a certain amount of bitterness. Such chocolate is often obtained from cocoa beans of characteristic harsh flavors. Accra, Trinidad, and Bahia nibs are often used to the extent of 80 per cent. The bitterness of these beans may then be counterbalanced by adding from 20 per cent upwards of several milder varieties, such as Ceylon, Java and Red Summer Arriba. The latter is particularly useful on account of its strong aroma and rich color. Some manufacturers prefer to use nearly 100 per cent of the bitter cacaos, because they are generally much cheaper than the milder species, and to eliminate the excess acrid flavor by adding suitable flavoring material at a later stage in the processing.

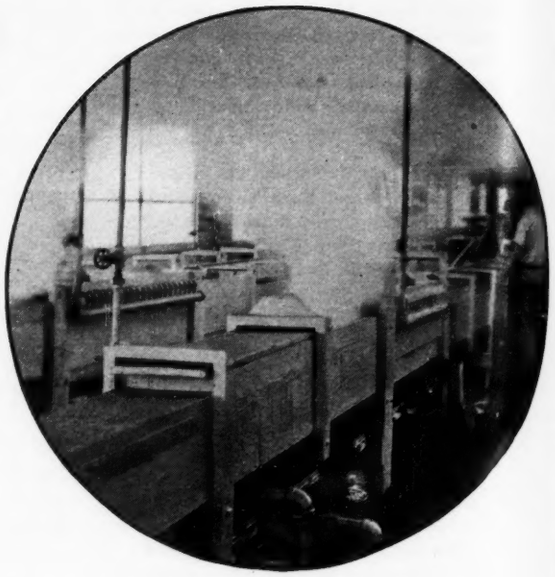
For high-class milk chocolate the blended cacao must be relatively light in color and possess no astringency. Consequently the proportion of the cheaper harsh cocoa beans may not be so high as in the case of plain chocolate. A typical blend in use in Great Britain includes about 60 per cent of West Indies cacao, of which 40 per cent is Grenada; 20 per cent Trinidad; 25 per cent Ceylon; and 15 per cent Arriba. For lower quality milk chocolate, however, a higher proportion of the cheaper beans is often used, and reliance placed upon other factors to eliminate undue harshness of flavor and deep color. In this connection, a soluble starch product, such as dextrin, or non-crystalline glucose syrup, may be utilized to counteract the acrid properties of the cheaper beans. The starch product is substituted for a part of the cane sugar normally used. Both glucose and dextrin blend with cacao better than does sucrose, and by so doing conceal the natural deep color of some cacaos better than does cane sugar itself. Because these starch products are considerably less sweet than cane sugar a considerable percentage may be added.

A type of confection which is becoming increasingly popular with the general English public is that containing a center of a heterogeneous nature. This chocolate is known as couverture (coating) chocolate. In this group may also be classed nut-chocolate. The cocoa beans selected for couvertures depend on the type of center which the chocolate is to cover. In the cheaper varieties the center is little more than a cheap filling, and, for these confections, coatings from lower grades may be used.

In good-class confections the center is of primary importance and must not be spoiled by an unsuitable chocolate covering. For such confections cacaos of light color and subdued flavor are essential. In general the cacao beans now used for this purpose are represented by 50 to 60 per cent Samoa or Grenada, 20 to 30 per cent Java or Ceylon, 15 to 20 per cent Venezuela, and from 10 to 15 per cent Arriba.

CHEAPER beans, often possessing considerable astringency, are in general use for low-grade couverture confections and also for the production of nut-chocolate. In this latter confection the nut component is found to be a valuable aid in combating the harsh and acrid flavor of some of the cacaos used. The centers of the cheaper class couvertures are often little more than a mixture of semi-crystalline glucose and dextrin; the latter to maintain a homogeneous composition by preventing crystal separation. These centers are highly colored and flavored, and in most cases the flavoring selected is capable of completely masking the bitter taste of the low grade chocolate covering. A typical cocoa bean blend for such cheap candy coatings is 40 per cent Accra, 40 per cent Cameroon or Bahia, 10 per cent Trinidad, and 10 per cent Arriba.

Quick Freezing



How it ties in with canning in the preservation of fruits and vegetables

By L. V. BURTON
Editor of FOOD INDUSTRIES

TWO or three years ago certain technical specialists in the field of fruit and vegetable canning pointed out that quick-freezing could gain twenty years of experience if it would but borrow the best ideas from the canning industry —a suggestion that has been followed. Today the indications are strongly indicative that as far as fruits and vegetables are concerned, the future of quick-freezing will be tied up with canning.

To get the necessary raw materials at the right prices those regions where canneries are now located are usually the best. And when it comes to the preparation of the raw material for freezing, those unit operations of the canner such as washing, grading, cutting, blanching and the like, are being already performed in canneries in the manner that requires almost no modifications to adapt them for the freezer.

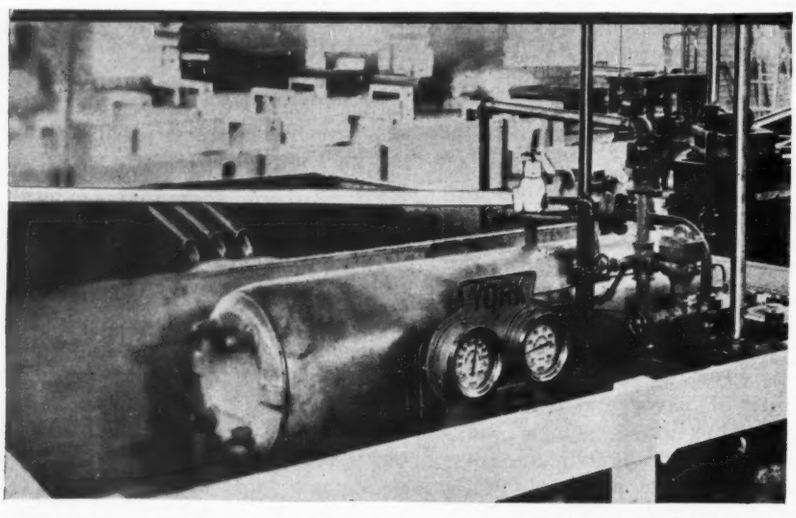
To adapt the Birdseye system to economical commercial production of frozen fruits and vegetables has required a portable machine which could be taken to the source of a given raw material moving it successively to other places where the crop was available. This required a revolutionary redesign of the freezing machines so that now, the Birdseye multiple plate freezer no longer resembles its huge predecessor. Only the original patented principle remains, namely of freezing in a package between two refrigerating surfaces (see F.I., April 1930, Page 159).

The first of the new machines, weighing only about 9 tons (compared to the original machine weighing about 30 tons) consisted of a self-contained unit on skids. The freezer itself comprised a set of movable flat aluminum plates 2 in. thick, inside of which were tubular spaces for direct expansion of ammonia for their refrigeration. These plates were so arranged in a vertical pile that the spaces between them could be opened, packages inserted for freezing, and then closed by hydraulic cylinder. Then the ammonia was turned on and the freezing operation commenced.

Immediately below the freezer was the individual ammonia compressor and condenser for the unit. The ammonia was connected to the plates by a flexible rubber hose of special extra heavy construction. To install one of the portable plate freezers required only connection with a 3-phase, 220-volt power circuit, and cold and overflow water piping, the latter to carry away the condenser water. It is then ready to run. Frosted Foods now has 27 portable freezers in operation.

The latest type, the ten station machine (see illustration), differs from the earlier multiplate freezer by using a separate ammonia compressor to operate three, four or five such units. This arrangement of equipment was made to avoid building machines which were too high to get into freight cars or low ceiling buildings.

By transporting the freezer from place to place, Frosted Foods puts

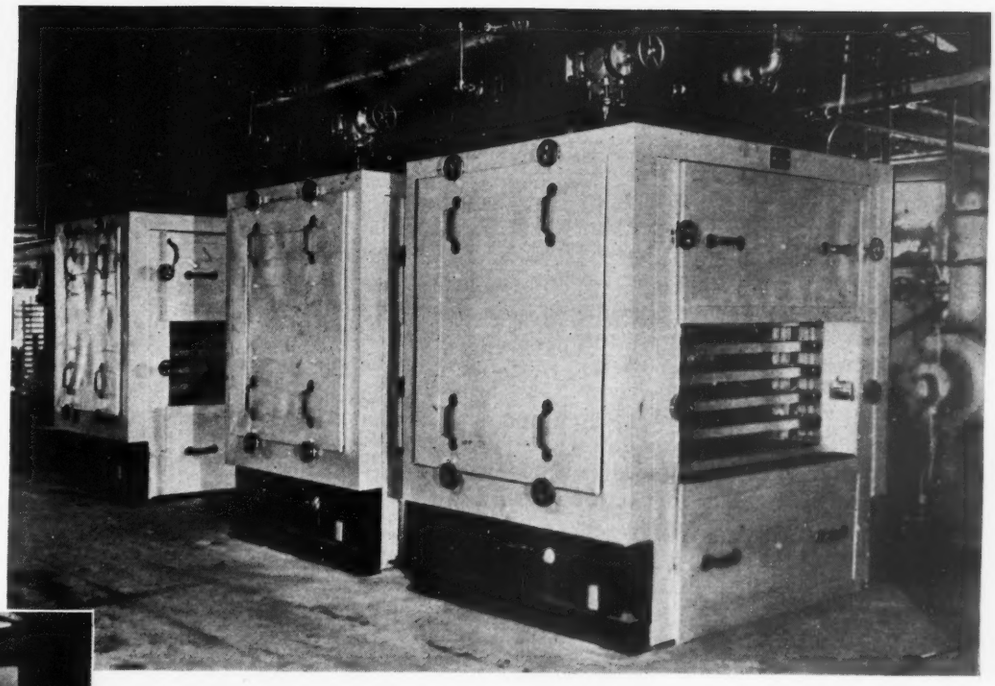


Refrigerating unit to chill the brine in the tank immediately behind. This brine both salts and precools the blanched asparagus.

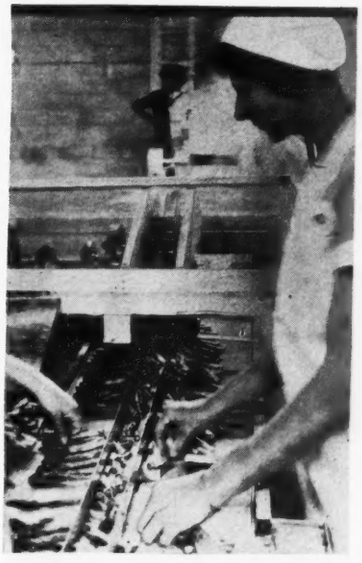
Right: Ten-station Birdseye multi-plate portable freezers, the last word in quick freezing machines, set up at Deerfield Packing Co.

Left: Steam blancher to inactivate enzymes in the asparagus. By changing the size of the top opening the time of blanching can be altered slightly.

Below: Check weighing and inspecting packing of asparagus before final tight wrapping and freezing.



several crops through them per season for only one or two crops would be possible in most locations. Furthermore, it is possible to follow a maturing crop Northward as spring advances and thus operate on the quality most suitable for freezing. The production schedule for 1935 calls for freezing: first asparagus, next peas and then lima beans, in Southern New Jersey. As soon as the last of the Jersey peas are completed, the freezers in this group are to be sent to Western New York State for more peas. Ultimately they will be back in South Jersey again for freezing lima beans in the autumn crop. In the winter time the probable plan is to ship the freezers to Texas for the winter crop of peas in the Rio Grande River Valley.



Inspecting and sorting cuts of asparagus as they leave the rotary cutter. Note the dividers to separate and divert the cuts.

Then the freezers will probably follow the strawberry harvest until it is time to send them back to New Jersey in the spring of 1936.

By such a plan of operation the fixed capital cost for equipment per pound of food frozen is kept at a much lower figure than is possible where stationary freezers are employed at suitable crop producing centers. But it is all predicated upon the existence of machinery for performing all other unit operations of preparing the various crops for freezing and that means a very close tie-up between the freezers and the canners.

Other important reasons exist for such a joint commercial relationship. Somebody has to make all of the arrangements with farmers for production of the crop, for receiving it and paying for it. Then, too, there are portions of a crop that, at present, seem to lend themselves better to canning than to freezing. And finally there is the possibility that slowness of crop deliveries or future commitments in some other region might warrant moving out the freezers before the crop is all harvested. This would leave the remainder of a perishable crop to be disposed of by canning.

ALL of the foregoing discussion goes to show that a successful but wholly new technical process usually requires a period of economic experimentation to determine just how it may be made a commercial success. This is exactly what quick-freezing has been forced to go through despite all of the capital, brains and enterprise back of the concerns which have employed this method of food preservation. Only comparatively recently has the cooperation between freezing and canning been realized to be a fundamental necessity for successful exploitation of quick freezing.

How this cooperative processing of a crop is carried out is illustrated by the principal asparagus operations at Deerfield Packing Co., Bridgeton,

N. J. Green asparagus is purchased locally or grown on the 6,000-acre Seabrook Farm on which the plant is located. Receiving, grading and paying is handled by the Deerfield organization. The "grass" must be very fresh either for canning or for freezing. Hold-over "grass" or returns from metropolitan produce markets will not be accepted. Responsibility for this part of the operation belongs to the canner.

In the factory the first unit operation is to lay the "grass" crossways on a La Porte mesh belt with the spears all pointing in one direction, flush with the guard rail at the edge of the belt. The belt passes under a pressure spray washer, passes girls who rearrange the stalks in perfect order just prior to their passage under special rotary knives which cut the grass, as shown in accompanying illustration, about 5 in. from the tip, with two more 2-in. cuts made simultaneously. Butt ends are discarded.

Short middle cuts are diverted on the belts from the tip cuts and are hand sorted for tenderness, the tough cuts being discarded and the tender ones going to the canning line. Here is the second place where the cooperation between the canner and the freezer comes into play.

Tip cuts, consisting of all sizes of "grass" from little spindly spears up to huge diameters into which Mary Washington asparagus sometimes develops, are sorted in the next few feet of belt travel. At this point the extremely small sizes that are better canned than frozen are sorted out by hand and canned.

The remaining tip cuts, comprising about 90 per cent of the total tip cuts, are conveyed to a soaking type of washer where any grit is loosened. In case of unusually gritty "grass," the water is warmed. This soaker-washer also affords a surge point where "grass" may accumulate if temporary delays occur further on. Another pressure spray washer is located on the line where the belt emerges from the soaker-washer.

Sorting the tips for size is the next operation—all hand work. In general three sizes are made here: the oversize, the undersize and the average size. Because most of the "grass" is of average size, it is permitted to move past the sorters on the belts and on to the next operation. Over and undersizes are accumulated temporarily and put in batches on to a second line.

From the sorting station the tips go to a 30-ft. steam blancher, after which the "grass" receives its fourth and last washing by a water spray. Experience has shown that all enzymes in vegetables must be inactivated by heat before freezing, otherwise the quality will slowly deteriorate even when it is held at sub-zero temperatures. This necessitates the unit operation called blanching at this point. The last washing after blanching is for the purpose of removing the heat from the "grass" rather than for further cleansing.

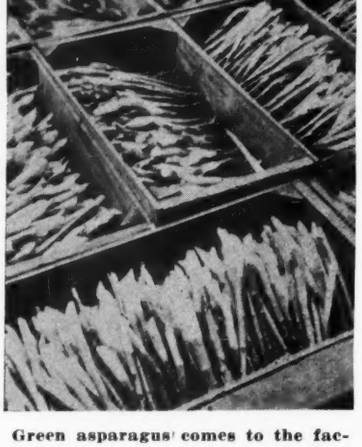
After the final washing, the "grass" is given an immersion in refrigerated salt brine for the purpose of conferring a slight amount of saltiness and for precooling the vegetable, thus eliminating a part of the refrigerating load from the freezing machine.

From the brining operation, the "grass" is carried in boxes to the packers who arrange it in uniform order and place it in cartons formed on a Peters carton-forming machine. After filling the cartons, they are placed on a traveling belt which carries them past two check weighers who adjust the final weight to either 1 lb. or 2½ lb. as the case may be.

Two inspectors observe the closure of every package before they go to a Johnson automatic sealer which tight-wraps and heat-seals the packages with Waxed Crystalline paper from Menasha Paper Products Co.

The wrapped and sealed packages are placed in trays, spacers to prevent crushing of the cartons in the freezers are inserted, and the trays then go to the multi-plate freezers for a period, depending on their size, of from one to two hours at —29 deg. F. (See illustration on front cover.)

REVERTING to the canning operations, it will be recalled that the very small tips are sorted out immediately after the cutting operation and that the middle cuts are sorted out to remove those which are unsuitable for canning. The amount of small tips is very meager.



Green asparagus comes to the factory loose in crates or in bundles.

Tips are successively hand blanched, then hand filled into cans, exhausted in the steam exhaust box, the lids seamed on, and then sterilized in retorts. The tender middle cuts, constituting a sizeable volume pass by six more sorters to remove tough or white pieces, and then pass through a spray washer and, next, through a steam blancher. For canning operations, the goods are better warm than cold. Hence the absence of a chilling spray at this end. The blanched middle cuts are caught in galvanized steel bushel baskets, carried to a revolving packing table of the semi-hand pack type, filled into cans, topped, brined, sealed and then sterilized in retorts.

A joint operation of this character carried at Deerfield's plant requires dual supervision and dual quality control though, of course, there must be clearly defined lines of responsibility. Under the present set-up, the working employees are presumably all Deerfield employees but a very careful, detailed record is kept of the work each one is doing so that costs are allocated correctly. While details of the business arangement are, of course, private, the principle is followed that Frosted Foods assumes the crop hazard and in return Deerfield assumes the labor hazard, i.e., the cost of getting the plant ready for processing a crop that may or may not actually mature.

If one may speculate on the future, it appears that the development of this joint system of processing will proceed with noticeable speed. And further, it would appear that this is a manner in which Northern fruit and vegetable packers will be able to meet winter competition from unprocessed vegetables coming from the extreme South, particularly on peas, beans, lima beans, asparagus, and spinach. While cost figures are not available, to an experienced observer it seems as though such a joint operation should reduce a canner's cost of production on those items which he actually packs in tin.

After freezing, the cartons are placed into double-double corrugated shipping containers, sealed, and then go to a temporary freezer storage. At suitable intervals, the goods are transferred in trucks refrigerated by solid CO_2 to central freezer warehouses.

Tests on bacon, potato chips, salted nuts, margarin, mayonnaise and salad dressings reveal retardation in development of rancidity by dusting with or adding finely-milled oat flour

Inhibiting Rancidity

Oat Flour Protects Fatty Foods

By SIDNEY MUSHER
President,
Musher Foundation, Inc.,
New York, N. Y.

Treating the surface of these potato chips with oat flour makes them keep from two to three times as long as untreated chips before becoming rancid.

Bacon can be protected from the development of rancidity by dusting the surface with oat flour, as was done with the bacon here shown before it was packaged.

PROTECTION of lard against rapid development of rancidity by use of ground or crushed seeds and cereals was discussed in the April, 1935, issue of FOOD INDUSTRIES, pages 167-168. One of the cereal flours cited was finely ground oat flour.

Since then tests involving a wider application of oat flour as an antioxidant have been brought to completion with significant results to supplement the report made concerning lard.

Before discussing further the results obtained by the use of oat flour it is well to repeat that of the cereal flours or crushed seeds possessing the property of substantially protecting lard against oxidation, soya flour proved more effective than oat flour. However, for products containing or processed with vegetable oils, the completed tests show that oat flour should be used. It not only possesses antioxidant advantages, but also is made available in a bland, stable, and readily usable form which inhibits rancidity because of oxidation, prevents the loss of flavor without imparting a new flavor, and avoids discoloration of foods on or in which it is used.

Covered by patents granted and pending in the United States and Europe (U. S. Nos. 1,816,338 and 1,841,842) this use of oat flour takes two forms of application: (1) addition of the flour to the fats or fat-containing foods, such as margarins, mayonnaise, and salad dressing, to retard or inhibit development of rancidity; (2) dusting of the flour over such foods as bacon, potato chips, and salted nuts to retard rancidity, loss of flavor, and discoloration. Additional work is being done to investigate the application of oat flour to such other products as fish, soda crackers, powdered milk, and other fat-containing foods and to such wrapping materials and containers as vegetable parchment, waxed papers, cartons, tubs, and barrels used for lard, butter, and oleomargarine.

Treatment of the specific foods identified as being protected against rapid rancidity development by this method may be expressed as follows:

BACON is subject to oxidation and rancidity probably more than any other meat product. The pro-oxy-

genic activity of the fleshy tissues is considered responsible for the ease with which it undergoes oxidative changes. A series of tests shows that the dusting of 1 per cent by weight of finely-milled oat flour over sliced bacon will substantially inhibit the development of rancidity. Obviously the coverage should be as complete as possible and the oat flour used should be finely-milled to give that coverage.

Although 1 per cent of oat flour dusted upon sliced bacon protects it from oxidative deterioration for a period about twice as long as normal, it must be remembered that the protection afforded will vary approximately with the percentage of oat flour used. By that is meant that 1½ per cent will be substantially more effective than 1 per cent, and so on, with the increasing percentages of oat flour used.

In addition to adding oat flour to the mix in making this mayonnaise, a film of the flour dusted on the upper surface before the jar was sealed prolongs the life of the product by giving extra protection to the exposed area.

Not only was the incidence of rancidity retarded by treating these salted nuts with oat flour, but the fresh flavor of the nuts is retained by the treatment for a considerably longer period.

The flour may be applied immediately at the cutting machine as the strips of bacon are sliced. Tests show it to be absorbed into the surface of the bacon within a few days after the dusting has taken place and that discoloration does not occur. Furthermore, the Bureau of Animal Industry has indicated that it will permit the dusting of oat flour over bacon in plants operating under government inspection. When large slabs of bacon such as go for export or for butcher shop distribution are to be protected, the use of but a fraction of 1 per cent is necessary, because of the greater mass and the less surface of the meat to be protected.

Such other meats as are subject to rancidity may be treated in the same manner. Bacon, however, offers the greatest difficulties and the loss of considerable export trade is believed due to the tendency of bacon to deteriorate rapidly even when kept under favorable storage conditions.

POTATO CHIPS should be dusted with 3 to 5 per cent of oat flour mixed with the salt or as a separate operation. Such a large surface area is exposed that rapid deterioration of the chips results unless protection from oxidation is given.

Under conditions of accelerated tests, such as exposure to direct sunlight, treated chips will keep from two to three times longer than the untreated by reason of this dusting operation. Furthermore, it has been found that the flour is absorbed into the surface within two or three hours after application so that its presence on the chip is not noticeable.

SALTED NUTS are protected against rancidity by dusting with 1 to 2 per cent of oat flour. The application procedure is the same as in the case of potato chips.

With nuts, as in the case of all products subject to rancidity, the protection is first apparent by the retention of flavor in the treated product. Blandness occurs before objectionable rancidity sets in and therefore the development of rancidity actually follows the loss of flavor. In the case of nuts, the untreated nuts become quite flavorless before rancidity develops. Hence dusting with oat flour not only inhibits the development of rancidity, but also protects those nuts against the loss of their original fresh flavor.

MAYONNAISE and salad dressings are composed of globules of oil surrounded by a thin film of egg yolk or other emulsifying agent. Consequently the greatest effective use of the oat flour in inhibiting rancidity of the oil in mayonnaise is obtained when from 1 to 3 per cent of oat flour is added to the egg yolk or other emulsifying agent even in preference to adding it to the oil. When thus added to the mix, the oat flour tends to surround and protect the outer surfaces of the globules of oil in which the oxidation and rancidity always takes place.

Additional protection may be given to these products by merely dusting the surface of the jar with a thin film of oat flour, by placing upon their surfaces a sheet of parchment paper dusted with oat flour, or by using a cap liner treated with oat flour, in contact with the top of the mayonnaise. Even though rancidity proceeds throughout the jar, the greatest deterioration occurs at the surface and proper protection can only be given by these means.

In the case of French dressing, the oat flour may be added directly with the spices or may be mixed with the oil.

MARGARIN is satisfactorily protected by adding from 1 to 2 per cent of oat flour, based on the total weight of the batch, to the oil before it is blended with the other ingredients.

When the samples are held under refrigeration, the margarin prepared with oat flour may be distinguished from the untreated control within about fifteen days after manufacture, the differences become increasingly greater as time goes on. It is estimated that 2 per cent of oat flour will extend the life of margarin to at least double; dependent, of course, upon the quality of the fats used in its preparation.

The tests by which these results have been obtained were carried out in the research laboratories of Musher Foundation and Princeton University, and were checked by control laboratories in commercial plants producing on a large industrial basis the commodities mentioned.

Foreign Matter In Ice Cream

How it can be avoided by strict adherence to proper methods of handling materials and product by manufacturing plant and dealer

AN INVESTIGATION carried out over a period of eight years by the laboratory of one of the largest ice cream manufacturing plants in the country covered all of the complaints received during that time of foreign material in ice cream.

This investigation was based on the premise that, when consumers find something in the product that should not be there, it is the duty of the plant to determine how it got there, and then take steps to prevent a recurrence of the trouble.

By study of the complaints, a routine procedure has been developed, by means of which definite improvement has been effected. The following, under the headings of the foreign material found in the product, details the course now followed to avoid its presence:

Glass. To avoid the possibilty of glass getting into the ice cream, metal graduates or measures are used for handling flavors and colors. Liquid flavors are stored in stone jugs instead of glass bottles. For carrying samples of ice cream from the freezers to the laboratories, metal sample tubes are employed. For glass over the peep holes of holding tanks, ½-in. plate is used, to avoid chipping from washing or heat. For freezer hoppers celluloid windows are used in place of glass.

Glass is, of course, used in the electric lamps, but these are enclosed in white porcelain globes, which prevent the fine glass from flying when a lamp breaks. Glass is also used in windows and partitions, but this is wire-glass which will not fly or fall if cracked.

Nails and Tacks. Formerly all sugar was received in barrels, with heads and hoops attached by means of nails. Sugar is now obtained in 100-lb. cotton bags, avoiding nails from this source. Other wooden barrels, formerly used for storing such products as nuts, salt and macaroons, have been replaced by galvanized steel barrels.

Tacks are not used for any purpose in an ice cream manufacturing plant.

Tin or Small Pieces of Metal. Any small piece of metal found in ice cream is usually referred to as tin by the consumer. It was found that these most frequently were small pieces of sheet metal broken off of the top edge of the cabinet-cylinder lining. This is caused by the dealer hammering the ring of ice or frost that forms on the metal, thus causing the metal, in time, to become battered or broken. In several cases it was found that pieces of this metal had broken and fallen off into the ice cream, causing complaints that mouths or gums had been injured.

Vermin, Roaches, Flies and Other Pests. To avoid trouble from roaches, bugs, mice and other pests it is necessary to constantly guard against infestation and to have regular weekly treatments of the plant and its contents by a capable exterminator. Plant windows should be completely screened from early spring until late into the fall.

Some complaints of bugs in strawberry ice cream, upon investigation, proved to be caused by strawberry stems frozen into the product. When embedded in the cream, with the calyx or "hull" spread out, the resemblance of a strawberry stem to an insect is marked. Care must be taken to prevent these stems from getting into the mix.

Wood. Pieces of wood that get into the products are most often caused by removal of the lids of barrels containing such products as cold-pack fruits. To avoid this trouble, the operator handling this department must be instructed to examine carefully the top surface of each barrel after the head is removed and see that no chips or splinters are lying on this surface.

Fruit Parts. Unwanted parts of fruits, such as peach and cherry pits, skins, stems, and even fruit worms, are sometimes found. Such occurrences can be prevented only by a rigid system of inspection, piece by piece, carried out by experienced workers who are held responsible for any complaints from this source.

Nut Parts. Pieces of nut shell and other hard parts of nuts, and even nails from the boxes in which nuts are shipped, may get into the product. These are removed after the nuts are roasted, when they are spread on an inspection table and examined piece by piece. The use of an electromagnetic separator will make for more certain separation of metallic particles and nails from nut meats. After inspection, nut meats should be kept in tightly-covered, galvanized-steel drums.

Screws, Nuts, Bolts and Other Small Metal Parts. Frequent inspection by the engineering department of all machinery used in manufacturing ice cream is the means taken to prevent small machine parts from becoming detached and falling into the product. Wherever possible, screws and bolt pins are soldered into place, or lockwashers are used to prevent them from coming loose.

Human Hair and Brush Bristles. Occasionally complaints occur of a human hair being found in ice cream. On examination, it generally turns out to be a bristle from a scrub-brush. Regular deplacement of worn brushes will lessen this trouble, although it cannot be entirely avoided. To avoid the possibility of trouble from hair, all employees must wear caps completely covering their hair while in the plant.

Flavors and Fumes. Difficulty is sometimes experienced from ice cream picking up off-flavors. The air around dealers' cabinets is sometimes so saturated with SO_2 or other refrigerants that the surface of the ice cream acquires a sulphur or other taste. When complaints of this nature occur, the ice cream should be immediately brought back to the plant, examined, and then destroyed.

On rare occasions, the flavor of gasoline or kerosene has been noted. The source of this trouble has not been traced.

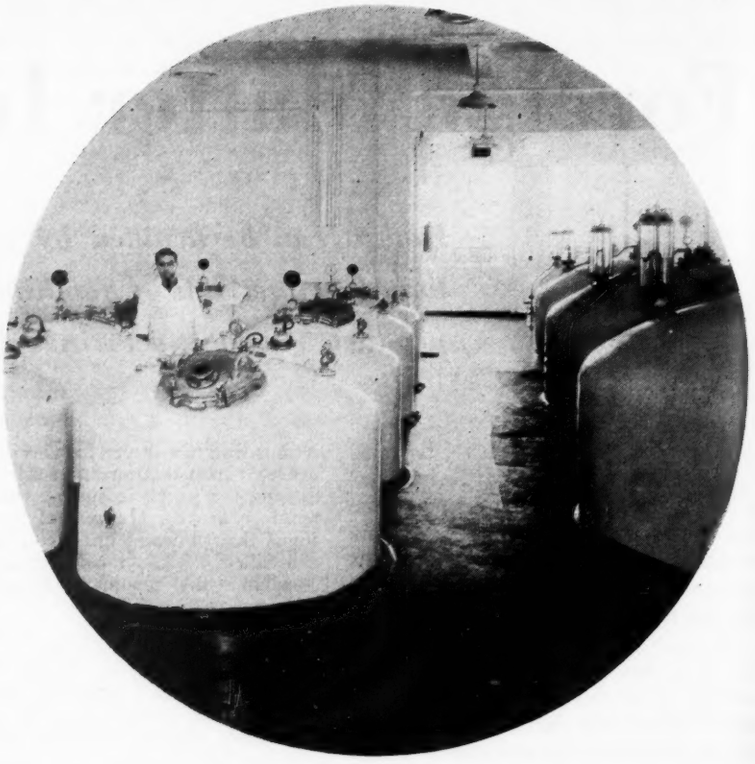
Straining Cream. In handling fresh cream through the plant before manufacture into ice cream, the practice is to pass it through three strainers with very fine perforations. The first straining, immediately after the cream is emptied into the mixing vat, is designed to eliminate the possibility of wires which are used to fasten the lids on the cream cans from getting into the mix. The next straining comes immediately after the cream has been pasteurized, and its purpose is to remove cotton threads or strings from the sugar bags. The final straining occurs just before the cream and sugar mixture passes through the freezer, and is used as a final precaution against the presence of foreign material in the mix.

Trouble at the Dealers'. It was ascertained that dealers often remove the lid and paper from the top of the underneath can in the cabinet hole, thus placing the bottom of the top can directly upon the surface of the ice cream in the lower can. The film of ice or moisture on the can bottom may pick up all sorts of dirt and foreign matter when the can is lifted out and rested on the floor, and then, when placed back in the cabinet, all of this matter is deposited on the ice cream in the lower can. This practice is unquestionably the cause of many of the mysterious foreign-matter complaints that are encountered. This practice should be avoided. Route sales and delivery men should be responsible for training the dealers to keep lids on the botton cans in the cabinets.

"Closed" Brewing

Using the Nathan system, Hoffman Beverage Co., insures product quality through cleanliness in plant and process. Fermenting cellar eliminated. Beer is "aged" quickly.

By HALDANE GEE
New York, N. Y.



On the right are some of the enclosed aluminum fermenters in the Hoffman plant. There are 32 of these, each of 280 bbl. capacity. Fermentation, aging and carbonation take place in the same unit. On the left are eight refrigerated vessels for storing yeast used to inoculate the fermenters. The equipment is immaculate.

FIRST of the post-repeal companies in the United States to adopt the Nathan system of beer manufacture, Hoffman Beverage Co., Newark, N. J., has built a 225,000-bbl. brewery, which is a model of food-plant sanitation. The Nathan process is one with intrinsic hygienic advantages, and the Hoffman concern itself has long held to a rigid ritual of plant cleanliness. So the plant, combining as it does both Nathan and Hoffman experience, represents a new step in brewery modernization in North America. The product is handled in sealed equipment from start to finish, and the plant answers in the affirmative the question as to whether closed-system brewing is successful, at least in this case.

One of the oldest of the food industries, brewing has been alive to problems of sanitation since its inception. The need for cleanliness of equipment was well recognized in the days of open, wooden fermenters. The transition from that era has involved problems both in beer technology and in large-scale handling of edible materials.

Early brewers sought to control "diseases." Modern bacteriological practices have endeavored to eliminate infection by molds, bacteria and wild yeasts through a sanitary wort system and pure culture fermentation. These efforts, however, gained a reputation for impracticability among brew masters. Obstacles which may be encountered include the difficulty of maintaining effective sanitation in closed equipment and piping systems and disastrous attenuation of organisms in the yeast culture apparatus. Causes for pipeline troubles are not as obscure as they were a few years ago. Attenuation of yeast has been traced to metallic poisoning possible with metal culture vessels, and it has been avoided by the use of glass-lined tanks for the production of starter.

A final stumbling block was found to be chemical, persisting after bacterial difficulties had been eliminated. This drawback, an unfavorable effect on flavor, was traced to the use of a strictly closed cooler for the beer wort. A cooling device which prevents or restricts aeration of the wort is not a satisfactory production unit. Both chemical and bacteriological objections are met, however, by an open cooler supplied with filtered air. Solution of this final problem paved the way for beer manufacture under complete chemical and bacteriological control.

THESE and other advantages are emphasized in the Nathan process, which uses special equipment for cooling, clarifying, production of inoculant, fermentation and carbonation. To this chain the Hoffman Beverage Co. adds its own improved bottling routine.

Nathan wort cooling units retain the advantages of aeration but exclude contaminating organisms. The cooling must provide for both oxidation and oxygenation of the hot wort. Open Baudelot coolers are therefore used to lower the wort from boiling to fermenting temperature. Although apparently an open link of the system, the coolers are supplied with filtered air, which minimizes infection in this ordinarily precarious stage of beer production. At the Hoffman plant, the closed cooler compartment is sterilized before use and is equipped with observation windows so that attendants need not enter while the coolers are working.

Nathan clarifiers are completely enclosed, but come apart for cleaning. Hosing between brews removes the coagulum from these units, as it does from coolers. The Hoffman routine specifies sterilization of clarifiers, also.

NATHAN fermenters are closed, with dome tops and conical bottoms. Refrigeration jackets provide

exact temperature regulation independent of fermenting room temperature. The refrigeration assists also in settling the yeast. Fermentation is conducted at about 40 deg. F. and requires eight to ten days. Evolved carbon dioxide is recovered, purified and utilized. Near the end of the fermentation, the fermenters receive CO_2 under a pressure of 5 lb., and the fermenter cones are refrigerated. This double physical treatment stops agitation of the yeast and packs it in the cone of the tank ready for removal. With this method of removing the yeast from the beer, the Nathan process inverts the customary procedure of pumping the beer away from the yeast. The Hoffman installation includes 32 aluminum fermenters of 280 bbl. each.

The maturation process follows removal of the yeast and takes place in the same fermenter. It is accomplished by passing a finely divided stream of CO_2 upward through the fermented wort for from one to two days, a procedure which washes out so-called "young substances," removing the "mysterious" chemical constituents responsible for the harsh odor and taste of "green" beer. This maturation process is said to achieve any and all desirable results of prolonged periods of "natural" aging as judged by the ultimate criteria, which are taste, odor, body and head of the finished product. It greatly shortens production time, commonly two months or longer, thereby having an important bearing on plant capacity, general overhead and production flexibility, the latter being an important consideration in the summer beer rush. After aging, the beer is carbonated, which requires about twelve hours. Then it is filtered and bottled.

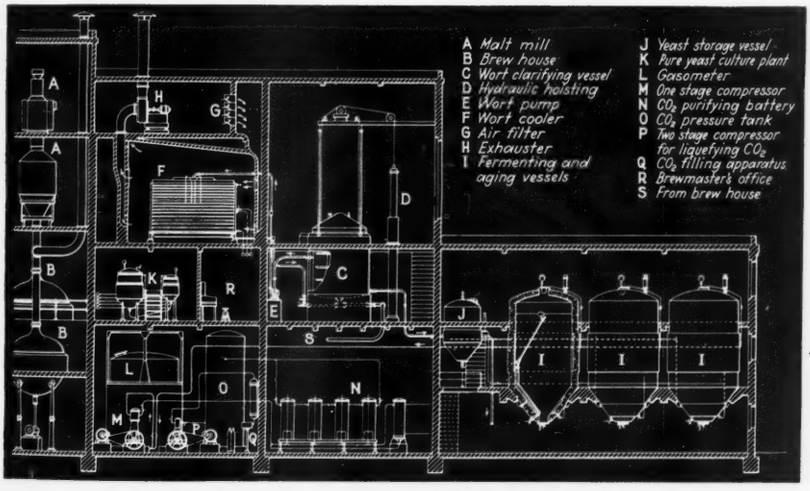
Curtailment of production time is not exploited by Hoffman. This manufacturer does stress, however, the sanitation aspects of the Nathan system, and emphasizes also the fact that the only gas employed in carbonation is the natural CO_2 of fermentation. The company strives for complete asepsis throughout the plant. These efforts have been so successful that bottled beer is distributed without pasteurization, a considerable achievement.

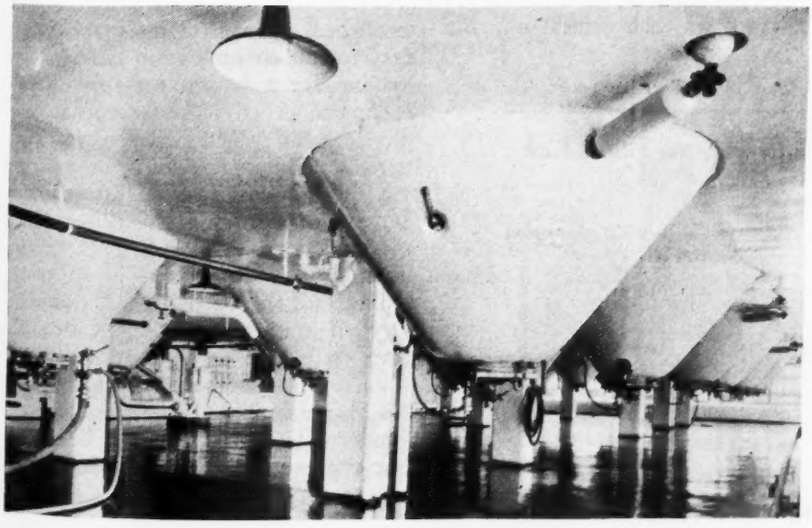
Among factors which contribute to the success of the Nathan process is the maintenance of a vigorous strain of yeast. General plant design and arrangement of equipment are all calculated to promote the growth of healthy cells throughout the fermentation cycle.

To some extent, the success of the Nathan system is dependent on "sterilization" procedures. The agents used include steam, hot water, alcohol vapor and antiseptics which eliminate harmful organisms.

GROWING popularity of the Nathan plants has prompted changes in older breweries seeking to modernize existing equipment. Among them has been the introduction of air conditioning in cooler rooms, which is arranged so that the hot wort receives only filtered air at regulated temperature and humidity. This development, apart from its immediate effect on the taste of the product, has also conferred incidental benefits by eliminating drip and spray from the plant department containing the Baudelots, an improvement which helps to control mold infestation. Similar uses for air conditioning have been found in other food establishments, elimination of mold from wrapped bacon being an example.

The Nathan system is the development of Nathan Institute, Inc. Headed by Dr. Leopold Nathan, this organization entered the industrial fermentation field in Europe before the War. One small Nathan brewing plant was opened in Texas during this period, but it was closed by prohibition before it had a chance to gain much recognition. There are now some 35 Nathan breweries in all parts of the world, with a combined production in excess of 2,500,000 bbl. Numerous refinements have been introduced during the twenty or more years of operation.





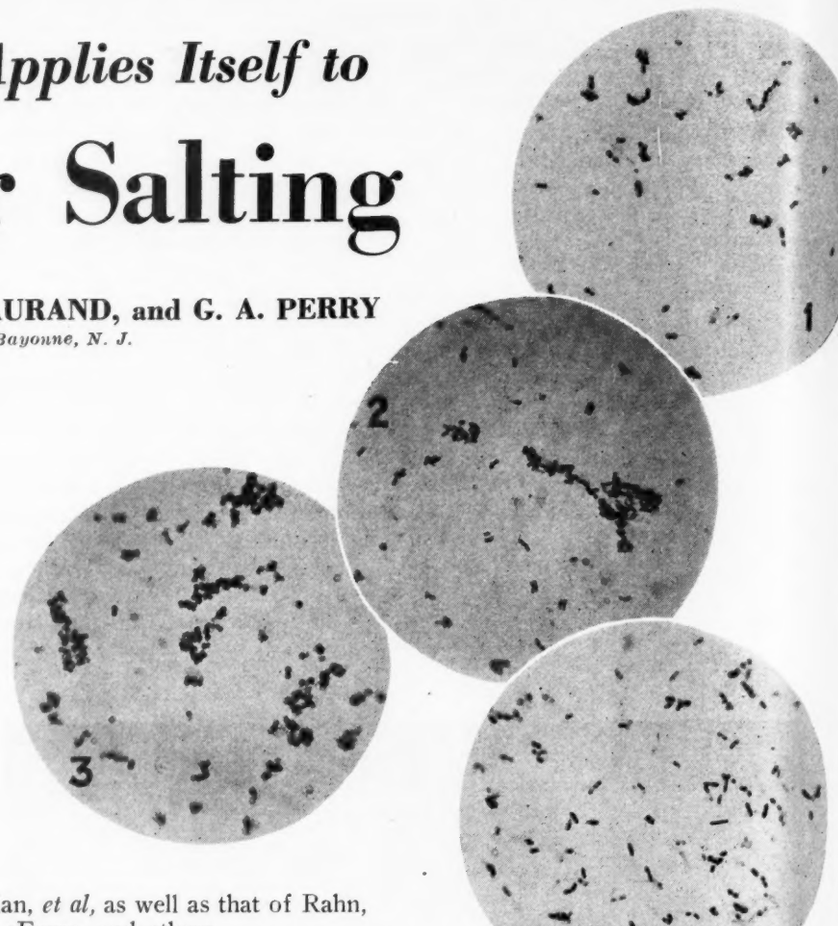
No cellar is needed in this brewery. The fermenters have conical bottoms which are insulated and refrigerated. Fermentation temperature is controlled independent of room temperature. Application of refrigeration at end of fermentation packs the yeast in cone ready for removal.

Modern Science Applies Itself to

Cucumber Salting

By H. W. VAHLTEICH, C. H. HAURAND, and G. A. PERRY

The Best Foods, Inc., Bayonne, N. J.



Some of the cultures isolated from brine samples from tanks 10 and 11 (600). Fig. 1 is culture 10 Ab (see Table I). Fig. 2 is culture 10 Ba (see Table I). Fig. 3 is culture 11 Bb (see Table II). Fig. 4 is culture 11 Be (see Table II).

PUBLISHED scientific work on the bacteriological aspects of the fermentation of cucumbers for the production of salt stock subsequently to be used for various pickle products, while by no means meager, cannot be said to be abundant. In this country, the names of Rahn and LeFevre are well known in this field, but prior to Rahn's work of about twenty years ago very little published work is to be found in the literature, either American or foreign. When only the fermentation of cucumbers in large vats or tanks on a commercial scale is considered, the published bacteriological studies of cucumber salting are almost rare in occurrence. In their excellent study of cucumber fermentation in barrels, Fabian *et al* (1) have recently given a comprehensive bibliography of work in this field which we have drawn on considerably so that it is hardly necessary to include a lengthy bibliography herewith. Likewise, it is reasonable to assume that those interested in the technical aspects of cucumber fermentation are familiar with this recent work of Fabian, *et al,* as well as that of Rahn, of LeFevre, and others.

Probably most salters who use vats have occasionally also used barrels or olive pipes for salting at the same time to take care of such salting of excess stock as necessary. This has been our experience from time to time and on at least one occasion we have observed that the same stock which became soft in the vats was perfectly sound and firm in all the barrels used. On other occasions, when comparisons were available, the barrel stock was the firmest and the best cured. These experiences led us to conclude that it is relatively easy to salt cucumbers in barrels. In looking for a reason for this difference, one is led to observe that one physical difference between vat and barrel-brining is obvious: in a large vat the stock is pressed against the battens or covers from below with great force, which alone goes far in crushing the stock and in injuring what Rahn has called the "architecture of the cucumber." Naturally, also, compressing the cucumbers into a mass will hinder easy circulation of the brine among them and hence hinder the circulation of desirable bacteria when these are added as an aid to proper fermentation.

IN ONE instance of vat fermentation which we experienced some years ago, there was a very meager

Analyses of Brine Samples Taken at Various Intervals After Filling Vats

Days after filling and battening that sample was taken	Sample	Plate count per cc	pH	Per cent acid as lactic	Salt	Temperature of vat when sampled
		Tank 10 (1)				
1st day	A	35,000	4.5	0.03	10.1	74° F
7 days	B	7,900,000	3.7	0.30	10.0	76° F
14 days	C	270,000	3.7	0.30	11.4	84° F
21 days	D	520,000	3.9	0.30	12.0	82° F
28 days	E	1,210,000	3.7	0.30	12.3	81° F
42 days	F	22,000	3.7	0.20	14.3	81° F
56 days	G	30,000	3.7	0.30	14.7	81° F
116 days	H	10,000	3.7	0.20	15.8	81° F
		Tank 11 (1)				
1st day	A	1,150,000[1]	5.5	0.03	11.5	76° F
7 days	B	30,000,000	3.7	0.30	9.6	78° F
14 days	C	500,000	3.7	0.30	10.6	84° F
21 days	D	140,000	3.7	0.30	11.8	80° F
28 days	E	119,000	3.7	0.30	12.4	80° F
42 days	F	13,600	3.7	0.20	13.7	80° F
56 days	G	2,260	3.7	0.20	14.8	81° F
116 days	H	10,000[2]	3.7	0.20	16.1	.....

Note: Plate counts made on dextrose agar plates incubated 48 hours at 35 deg. C.
[1]Many spreaders. [2]Estimated.

Studies on Acid-Producing Bacteria Isolated from Fermenting Pickles

Two types of acid producing bacteria were isolated: (*a*) gram positive rods, strong acid producers and (*b*) gram positive cocci, low acid producers.

Identification of Gram Positive Rods (a)

Only two cultures were studied among six available as the others were alike morphologically, and produced the same amount of acidity in cucumber juice.

Culture	Motility	Gelatin Liquefaction	Indol Test	Capsules	Agar slant (dextrose agar)	Nitrates
10 Ba, 10 Ba′	Non-motile	None	Neg.	Absent	Poor, slow growth in dots, rather grayish	Neg.

Sugar Reactions—No Gas in Carbohydrate Media

Culture		Maltose	Lactose	Raffinose	Dextrose	Sucrose	Arabinose	Trehalose	Galactose	Mannitol	Litmus Milk
10 Ba, 10 Ba′	acid	+	+	+	+	+	+	+	+	+	Slightly acid, no coagulation

These strains, 10 Ba and 10 Ba′ were identified as *Lactobacilli cucumeris* (Bergey 4th Edition) as they cover completely all the physiological reactions described for this organism.

Note: In this and subsequent experiments all polysaccharides were sterilized separately in 30 per cent solution and then added to the nutrient broth to make a 1 per cent solution. All simple sugars were sterilized as 1 per cent solutions in the nutrient broth. The tubes were incubated at 20-25 deg. C. for seven days.

Studies on Low Acid Producers (b)

Identification plan as per reference (2). No gas produced in carbohydrate broths.

Strain	Dextrose Agar Slant	Motility	Gelatin liquefaction	Nitrates	Indol	Litmus Milk	Capsules
10 Ab	Rather poor growth	—	—	—	—	Slight acid No coagulation	Absent
11 Bb	Abundant growth	—	—	Definitely positive	—	No growth in 5 days	Absent

Strain		Sucrose	Arabinose	Xylose	Dextrose	Maltose	Raffinose	Lactose	Levulose	Trehalose	Dextrin
10 Ab	acid	+	+	+	+	+	+	+	+	+	+
11 Bb	acid	+	—	—	—	+	+	+	+	+	—

Strain		Galactose	Mannite	Salicin	Inulin	Mannose	Rhamnose	Sorbitol	Slime formation in sucrose gelatin
10 Ab	acid	+	—	+	—	+	—	—	Negative in all cases
11 Bb	acid	+	+	—	—	°	°	°	Negative in all cases

° = not studied.

Note: Various sucrose gelatin media containing nutrient gelatin with amounts of sugar from 1 to 10 per cent, and enriched by tomato juice and yeast extract, were used.

10 Ab Culture. Acid titration in 1 per cent levulose + 1 per cent yeast extract broth incubated ten days at room temperature equals 0.26 per cent lactic acid.

11 Bb. Not studied for acid formation.

Studies on Gas Formation

Strains 10 Ab and 11 Bb were inoculated in cucumber juice enriched with 0.2 per cent yeast extract, and in plain cucumber juice, sealed with sterile paraffin and incubated at 37 deg. C. and at 20-25 deg. C. There was no gas collected under the paraffin plugs in any of the tubes incubated at 37 deg. C., while definite bubbles of gas forcing the plugs slightly upwards were noticed in the tubes enriched with yeast extract, incubated at 20-25 deg. C. More active gas formation was noticed in the 10 Ab culture. Plain cucumber juice with either strain did not show definite gas formation.

Discussion of the Results on Gram Positive Cocci

Strains 11 Bb and 10 Ab were identified as cocci probably belonging to the genus *Leuconostoc* described by Hucker & Pederson (2). Their carbohydrate reactions cover almost completely those of the *Leuconostocs* described by these authors. Formation of gas (CO_2) in cucumber juice sealed medium, fermentation of some sugars only when accessory substances were added, and the amount of acid in 1 per cent levulose + 1 per cent yeast extract broth indicate also that the organisms belong to the *Leuconostoc* group.

In this study only one reaction did not yield positive results. According to Hucker & Pederson's report, most of the *Leuconostocs* isolated from fermenting vegetables produced slime in sucrose gelatin. This reaction we could not obtain although different percentages of sucrose were used (from 1 to 10 per cent, enriched with tomato juice and yeast extract) and several transfers made from one slant to another; but it should be mentioned that among the 80 strains of Hucker & Pederson's *Leuconostocs*, none is reported as having been isolated from brined cucumbers.

The two isolated strains differ somewhat. 11 Bb falls into the group which is sucrose-fermenting, pentose-non fermenting. 10 Ab is in the sucrose and pentose-fermenting group. As would be expected, the pentose-fermenting strain showed more fermenting power (dextrose, dextrin, salicin fermented and more gas formed in sealed cucumber juice medium). It is interesting that 10 Ab and 11 Bb strains differ morphologically also, as photo-micrographs show. The 11 Bb showed abundant growth on agar slants while 10 Ab showed scanty growth.

While there is some uncertainty about the exact species, due to the discrepancies in slime formation noted and also in the reduction of nitrates by strain 11 Bb, this organism is similar to and may be identical with *Leuconostoc dextranicum* (Bergey). The 10 Ab strain is similar to and may be identical with *L. mesenteriodes* (Bergey).

Studies on Possible Acid-Reducing Microorganisms Isolated from Brine Cucumbers

The presence in the brine samples of bacteria reducing acidity (similar to those known in milk) is doubtful. Turbidity of the broths used for acid studies interfered with the determination of a sharp end point in titration, and, therefore, occasional results showing a slight decrease in acidity have been obtained. The pure culture study of 11 Be shows that the suspected "acid reducer" actually *forms* acid from levulose, dextrose, sucrose and maltose.

Identification of the Strain 11 Be

Gram stain—gram positive rods, very large, in chains and in pairs. Central spores.

Capsules	Absent	Starch	Hydrolized
Motility	Non-motile	Dextrose	Acid
Indol	Not formed	Maltose	Acid
Nitrates	Not reduced	Sucrose	Acid
Nutrient broth	Turbid	Levulose	Acid
Potato	Yellowish-slimy growth		

Agar slant—thin, turning dirty yellowish in three to four days. No growth at 50 deg. C.

Litmus Milk—No acid. Very slow proteolysis noticed after eight to ten days incubation.

Gelatin—Liquefied, but very slowly.

Strain 11 Be resembles the strain described by Bergey as *Bacillus graveolens*. In order to observe the inhibiting effect of low pH and of different percentages of salt on this suspected "acid reducer," as well as the combined effect of salt and acid, the following experiments were made. Dextrose broths with different pH and different salt contents were inoculated with strain 11 Be and two similar strains, 10 Be and 10 De, and incubated for three days at 37 deg. C. The pH of the media were adjusted with hydrochloric acid.

Studies on Inhibiting Effect of Acid

Dextrose broth with pH

Strain	pH 4.0	pH 5.0
11 Be	—	+
10 Be	—	+
10 De	—	+

Studies on Inhibiting Effect of Acid and Salt

Dextrose broth with Ph 5.0

Strain	3% Salt	6% Salt
11 Be	+	+ (growth noticed only after three days)
10 Be	+	—
10 De	+	—

Studies on Inhibiting Effect of Salt

Dextrose broth at pH 6.6–6.8

Strain	3%	6%	8%
11 Be	+	+	—
10 Be	+	+	—
10 De	+	+	—

Round and Ellipsoidal Yeasts

Yeasts were the only active acid reducers found. Strain 10 Bd (ellipsoidal yeasts) reduced acidity very markedly. A round yeast, strain 11 Dc, that produced small amounts of acid and gas, was studied together with the 10 Bd strain to determine the restraining effects of salt and acid and also the oxygen requirements.

	Dextrose broth + salt. pH 6.2 — 6.7					Dextrose broth + Salt. pH 2.6	Dextrose broth + salt. pH 3.0		
Salt	10%	13%	15%	18%	20%	15%	10%	13%	15%
10 Bd	+	+	—	—	—	—	Slight growth	—	—	—
11 Dc	+	+	+	+	—	—	Growth	—	—	—

Oxygen Requirements

Dextrose broth with pH 5.0, inoculated and sealed with sterile paraffin and incubated at 37 deg. C. for 24 hours:

	Control	Sealed with paraffin
11 Dc	+	Gas produced; plugs forced upwards
10 Bd	+	Gas produced; plugs forced upwards

development of acid (0.03-0.07 per cent acid as lactic) in spite of heavy additions of a strongly fermenting brine liquor from another vat. No organisms known to be undesirable could be found at that time, but the cucumbers became soft (not slimy). Except for the fact that they were soft, they appeared normal in several respects: their color was normal, there was no evidence of mosaic or similar trouble, analytical determinations for ash gave normal figures and other results of our examinations gave no good clues for their soft condition. The addition of sugar and of dextrose to some vats was of no avail in stimulating the fermentation. In three to four weeks after battening, *i.e.*, closing the tank, the stock was soft. In looking further for a source of the difficulty the best theory which could be developed, based on the available facts, was that the cucumbers themselves were at fault. The growing season had been one of plentiful rain, usually at night, with bright warm sunny days, so that the cucumbers grew with extreme rapidity. It seems reasonable to expect that this rapid growth resulted in a weak cell-wall structure and hence in a mechanical destruction of the cell walls under the pressure resulting after battening.

This experience made evident to us the need for a bacteriological study of the normal cucumber fermentation for the production of sound salt stock as carried out in large vats (600-800 bushels) during the next season, in order that a more complete picture of the bacteriological aspects of cucumber fermentation

(Turn to page 364)

Table I: Cultures Isolated from Tank 10 (Colonies Picked from Dextrose Agar Plates)

From brine sample	Culture	Appearance of colonies on dextrose agar plates	Microscopic appearance-Gram stain	Cucumber juice media: Gas	Cucumber juice media: Per cent acid as Lactic	Remarks
10 A					Blank 0.09	
	10 Ab	Small colonies, in clusters	Gram-positive cocci	—	.10	
	10 Ab′	Small lens-shaped colonies	Gram-positive cocci	—	.10	
	10 Ac	Medium size colonies, elevated center with feathery edges; hard when touched by needle	Round yeasts	+	.19	Showed bottom growth in liquid media
	10 Ae	Small pin-point colonies	Gram-positive. Very thick rods	—	.10	Heavy pellicles and turbidity-obscure end point in titrating acid
	10 Ae′	Round flat colonies	Gram-positive. Very thick rods	—	.10	
	10 Af	Large, watery, drop-shaped colonies	Gram negative short rod resembling E. coli	+	.15	Produced slime
10 B	10 Ba*	Small, round colonies, larger than pin point	Gram positive short rods in short chains	—	.38	When gram stain is made from cucumber juice culture the rods appear very small and thin. Might be mistaken for cocci.
	10 Bc	Large, white, glossy, flat	Round yeasts	—	Blank .10 .14	
	10 Bd	Large, white, flat, powdery colonies	Ellipsoidal yeasts	—	Blank 0.10 .03	Produced yeasty odor in cucumber juice, also fairly heavy pellicles
	10 Be	Small, lens-shaped	Thick rods, somewhat cigar-shaped, Gram positive, but old cultures were not definitely positive. Central spores	+	.09	Produced heavy pellicles and turbidity
10 D	10 De	Small sub-surface colonies	Gram positive. Very thick rods	+	0.10	
10 E†	10 Ec	Small sub-surface colonies	Round yeasts		0.12	Similar to other round yeasts isolated and studied

*Representing three similar colonies. †Also 10 F, 10 G, 10 H.

Table II: Cultures Isolated from Tank 11 (Colonies Picked from Dextrose Agar Plates)

From brine sample	Culture	Appearance of colonies on dextrose agar plates	Microscopic appearance-Gram stain	Cucumber juice media: Gas	Cucumber juice media: Per cent acid as Lactic	Remarks
11 A	11 Af	Watery, drop-like, glossy colonies similar to 10 Af	Gram negative short rods		Blank .10	Appearing similar to coli-aerogenes type
	11 Af′	Red pigment producer		—	0.10	
11 B	11 Bb	Flat, white colonies	Gram positive cocci	—	0.18	
	11 Be	Lens-shaped colonies	Gram positive rods, very thick, almost cigar-shaped	+	0.09	Turbidity in broth obscured end point
11 C	11 Cc	Large, round, elevated, glossy surface colony	Yeasts, round to ellipsoidal in shape			Similar to other round yeasts isolated and studied
	11 Cc′	Small lens-shaped colony	Same as 11 Cc			Similar to 11 Cc
	11 Cc″	Small triangular shaped colony	Same as 11 Cc			Similar to 11 Cc
11 D†	11 Dc	Small sub-surface colonies (no other growth on plates)	Round yeasts	—	0.16	Similar to 11 Cc

†Also 11 E, 11 F, 11 G, 11 H. After 28 days fermentation (Samples E, F, G, H) round yeasts were the only organisms present.

FOOD PACKAGES and PRODUCTS

Pin Money Family. Using a distinctive container and "identical" labels in six bright colors, Pin Money Brands, Inc., Richmond, Va., has created an unusual package family for its nineteen varieties of pickles and relishes. The bright colors used for the labels—brown, blue, yellow, red, green and orange—give a striking rainbow effect when the containers are lined up on the grocer's shelf, counter or in the window. Dealers are expected to use them frequently for display purposes. In designing this family of packages, the manufacturer decided that it was unnecessary to have a different color combination for each of its nineteen varieties, thereby avoiding extra expense.

The Pin Money line, formerly known as Mrs. E. G. Kidd's Pin Money Pickles and recently purchased by John Read Burr, are prepared from old Virginia recipes in the "home-made" way with apple-cider vinegar. The containers are closed with a White cap.

Soft Natural Cheese. Something new in cheese has been developed by Pure Milk Dairy Products, Inc., Chicago. It is a soft, smooth-texture, natural cheese made from cow's milk with imported cultures. Manufactured by a special method under close quality control, the product is said to have the mellowness of high-grade European cheeses. Put up in circular-loaf form, the cheese is packaged attractively and with an eye to the practical. Wanting a transparent wrapper which would stick to the paraffine on the loaf, the manufacturers selected Protectoid. This is soft and adheres to the product even when it is cut.

Quick-Opening Sugar. Another manufacturer has adopted an easy-open wrapper for sugar tablets. National Sugar Refining Co. of N. J., New York, is enclosing its cubes in a paper jacket with a tab for tearing

and perforations to facilitate the operation. The wrapper tears in such a way as to leave its ends on the sugar cube, and these may be removed and the sugar dropped in the cup without touching the product.

Cellophaned Butter. With the new wrapper adopted by Armour & Co., Chicago, roll butter is permitted to exercise its eye appeal and at the same time is well protected. Armour is packaging its Cloverbloom roll in a special transparent cellulose known as MAT Cellophane. Consumers may see at a glance the color and texture of the product. The wrapper carries the necessary label elements, these being printed by Milprint Products Corp., Milwaukee.

No Sticky Fingers. Realizing that consumers get sticky fingers lifting layer cakes with meringue, marshmallow or icing out of the box, Schrafft adopted a package with a "front-door" exit. The company uses a folding box so constructed that it opens on one side, permitting the cake to slide out easily and conveniently. There also is a top cover. This arrangement permits the cake to be placed on the table in an undamaged condition.

Double-Capped Dressing. Prolongation of the life of salad dressing, both before and after opening, has been attained with the containers adopted by George Rasmussen Co., Chicago. The product is sealed in glass with a combination closure comprising a "top" seal and screw cap. The top seal is used in vacuum sealing the contents to prevent deterioration due to oxidation. In the home, the top seal is removed by perforating it, and then the screw cap is used for resealing.

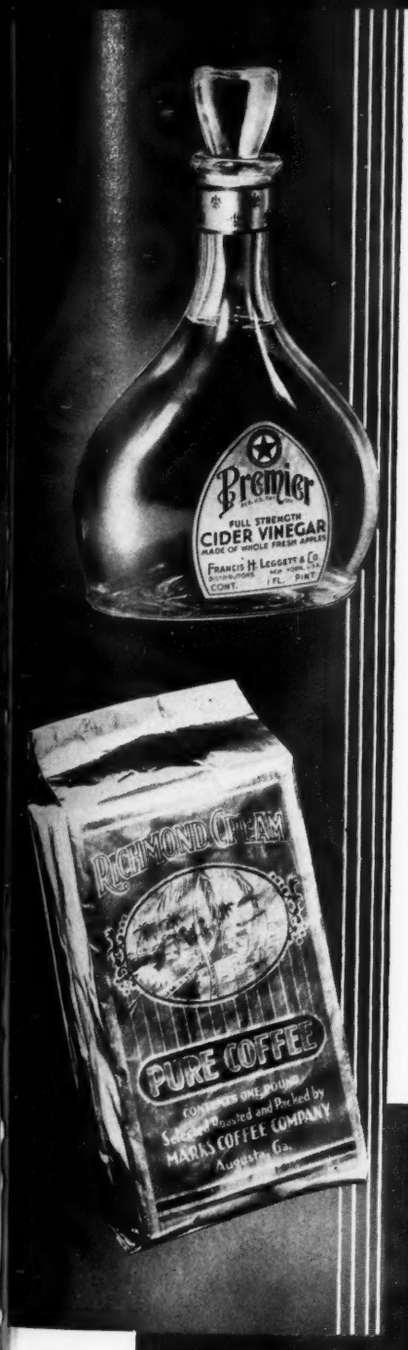
Concentrated Beverages. Successfully introduced in Wisconsin, "Holiday Drinx," a new condensed fruit flavor, is now being marketed nationally by Enzo Jel Co., Sheboygan, Wis. The preparation, which requires only the addition of water to make a fruit beverage, is made in six flavors—grape, raspberry, strawberry, cherry, orange and lemon-lime. It is ready-mixed with sugar, and a $\frac{3}{4}$-oz. package makes one quart of drink. The product is put up in cardboard cartons with a wax-paper inner container similar to that used in packaging gelatin.

Packs Apples in Brine. Canned apples for pie are a development of Cherry Growers Packing Co., Traverse City, Mich., and the company expects to effect commercial distribution by fall. The product is prepared from frozen apples which have undergone a patented process, the principle of which is that the air is removed from the fruit by a vacuum process and replaced by a weak brine solution. The canned slices of apple are reported to be tender and to retain their shape after being baked in a pie. The process is credited with intensifying the flavor of freshness.

Sunshine Flour. Wheat flour joins the ranks of vitamin D foods. Introduced by Sunfed Flour Mills, Minneapolis, the flour contains approximately 380 U.S.P. vitamin D units per pound. This will yield bread with a vitamin content of about 250 units per pound loaf. The vitamin is incorporated in the flour under the Steenbock patents. Irradiated ergosterol is first put into wheat starch, and the starch in turn is pulverized and added to the flour. This vitaminized flour sells at a slightly higher price than other high-grade, short patent family flours.

Jelly Powder. Powdered pectin in packages has been introduced by General Foods Corp., New York, under the name "Sure-Jell." Originally introduced on a limited scale in the Middle West, the product now is being distributed over a much wider territory as a companion product of

PACKAGES and PRODUCTS



"Certo," a liquid pectin in bottles. The end result of Certo and Sure-Jell in jam or jelly-making is the same.

Ingenious Vinegar Jug. At last there has been invented a vinegar container from which the diner may season his food without danger of submerging it in acetic acid. Adopted by Francis H. Leggett & Co., New York, the container is of the decanter type and has a hollow glass stopper. The stopper can be filled by inverting the container, and then it may be removed and used as a dropper for measuring out careful quantities. The decanter is attractive, and with the new dispensing stopper makes an ideal table container. It also has reuse possibilities, being suitable for wine or liquor, or as a refrigerator water bottle.

Metal Coffee Bags. Marks Coffee Co., Augusta, Ga., is putting its product in bags, but not the paper-type which recently has come into widespread use among coffee roasters. Marks is using a container of flexible metal. Although not revolutionary, it is one of the first commercial coffee bags in which the metal appears on the outside, the coffee being contained in an inner glassine bag. The package is credited with preventing loss of flavor over longer periods of time and maintaining quality longer after opening because of its reseal protection when folded. The product of Reynolds Metals Co., New York, the bag is printed in red and blue.

No. 10 Chow Mein. Chow Mein now is being canned in No. 10 cans, an accomplishment believed in the trade to have been most difficult, if not impossible. This is being done by Theodore Krainin, Brooklyn, N. Y. Suggested by the demand for a "gallon" container in restaurants and other large outlets, the large can is the product of some three months of experimental processing. Mr. Krainin also is packing the product in No. 1 and No. 5 tins. The former, put up in a folding display carton with a tin of noodles, comprises a chow mein dinner for consumption in the home. Made and packed in a government-inspected plant with modern equipment, the chow mein and noodles are protected by vacuum, this amounting to 14 to 16 in. on the chow mein and 3 to 4 in. on the noodles. The product is packed heavy in consistency so that when "cut" with a little soup stock the No. 10 can will equal a loose gallon.

The perfection of the bulk restaurant size of canned chow mein opens up many possibilities for distant and large-scale distribution. And it solves a difficult problem in delivery, since the loose product has to be delivered at frequent intervals and must be received by the restaurant before noon. Moreover, it enables the buyer to keep a large supply on hand to meet unexpected demands.

Jiffy Jelly. General Foods Corp., New York, has been conducting a test campaign in Pittsburgh on a new product of its research laboratories. Labeled "Jiffy," it contains natural fruit pectin and concentrated pure fruit flavor. Three ounces, retailing at 15 cents, will make five glasses of "jelly." Believed by its manufacturers to rival fresh fruit jelly in flavor, texture and color, the product appeals to apartment wives who want to make jelly quickly and inexpensively. Jiffy is made in three flavors, grape, currant and mint. Each case contains a four-colored window poster and a counter display container.

FOOD PACKAGES

Show Carton for Sugar. Believing that its snowy white sugar cubes had too much eye appeal to be hidden in opaque packages, Arbuckle Bros., New York, has adopted a window-faced carton. The lid of this package is provided with a transparent-cellulose covered opening through which the individual cubes may be seen. The window is made of heavy-grade Cellophane glued to the lid on the inside.

Canned Oyster Soup. Oyster soup ready to eat after warming can be bought in grocery stores on the Pacific Coast. And it will be available during the R-less months. The product of Padilla Point Oyster Co., Everett, Wash., it is the result of eighteen months of experimentation and consists of soup-size oysters cooked in a special stock with a whole-milk base. In working out the formula, there had to be overcome the technical problems of processing a nutritious milk soup base at a sufficiently high temperature to give complete sterilization of the oysters without developing a scorched flavor. The cans contain 10 oz. of soup, in which there are about twelve oysters.

Iowa Blue Cheese. With the idea of catering to America's preference for mild cheeses and at the same time provide a new outlet for milk produced in the West, Iowa State College of Agriculture and Mechanic Arts, Ames, has developed a new Roquefort type cheese. Made from raw cow's milk, the cheese is cured in air-conditioned rooms and packed in foil. The cost of manufacture, exclusive of milk, is estimated at 11.38 cents per pound. More than 72,000 lb. of milk has been made into the product and distributed through regular grocery channels at a wholesale price of 32 cents. A detailed description of the process for producing this Iowa Blue cheese has been published by the university in Bulletin 324.

Upstanding Butter. A new package created by Page Milk Co., Merrill, Wis., for its creamery butter stands up, and out. Instead of using the customary label, the company has adopted one of the "vertical" type so that the container must stand on end to be right side up. This means that it must be placed in showcases in a vertical position, permitting it to tower over competitive packages. The package also is more modern in appearance, being devoid of superfluous printing and having a large amount of empty space around the label. The carton is in a buff, orange and black color combination.

Lighthouse Vinegar. A quarter of a century ago, National Fruit Products Co., Washington, D. C., started packing its White House vinegar in a reuse container comprising a straight jar with a Mason cap. This proved popular, and since that time a long line of useful and novel packages have been adopted. Almost every year there has been something new—jugs, water bottles, vases, pitchers, apple-shaped containers and so on—to give added value in an attractive package. This year it is a miniature lighthouse designed by Hazel-Atlas Glass Co. Well received in the trade and by consumers, it has a small cork-closed opening suitable for controlled dispensing.

Plain But Good. A simple yet effective design has been created for the Eatsum wafer package of Mrs. L. M. Peterson & Co., Inc., Brooklyn, N. Y. The carton, which is of the folding type, is printed half in yellow and half in black, and it has the likeness of one of the dainty wafers on the front panel. The design

emphasizes both the brand name and the nature of the product. To keep the wafers fresh and crisp, the carton is wrapped with sealed transparent cellulose.

Violates the Rule. Tradition was thrown to the winds by United Drug Co., Boston, when it selected the design for its one-pound Gales party box of assorted chocolates—and with good results. A one-layer box was decided upon, although it is generally conceded in the candy business that the sterotyped two-layer extension edged box has been more successful in pulling sales. The container is of cardboard covered with brown suede paper and wrapped in sealed transparent cellulose. A circular white seal lettered and embossed in gold adorns the upper left-hand corner, and a wide, yellow silk ribbon across the opposite corner adds the finishing touch. On opening the package, the consumer sees attractive gold lace around the edge and an artistic arrangement of dividers and pieces. The package is for a new line of six numbers selling at $1 to $1.50 a pound.

Three Dressings. One of the pioneers in the packaging of products in containers for which the housewife finds continued use, Kraft-Phenix Cheese Corp., Chicago, has introduced three attractive additions to its "Kitchen - Fresh" line, "Taste - T - Sandwich Spread," "Thousand Island Dressing" and "Ham-N-aise." These products are put up in vapor-vacuum-sealed glass tumblers with closures held on by the vacuum. This type of package attractively displays the contents, is easily opened and has reuse attraction. The closures are by White Cap Co.

Muffin Crisps. "Starch reduced for weight control" is the slogan for the new Swedish style wheat crispbread of Huron Milling Co., Inc., Harbor Beach, Mich. Called "Toasted Muffin Crisps," the product is manufactured in thin wafers. To enhance its flavor, part of the salt is put on the outside instead of all on the inside. Muffin Crisps contain less than half the starch and more than three times the protein of white or whole-wheat breads.

The package for this new product is interesting. A folding carton, it opens on the broad side to give convenient access to the contents. But it is printed in the same manner as a vertical carton which opens at the small end, this permitting it to stand up and be easily seen on the retailer's shelf. To protect the delicate crisp wafers against breakage in handling, the package is lined with corrugated paper which acts as a shock absorber. The carton is wrapped in sealed transparent cellulose to maintain the crispness of the biscuits.

Coffee Balls. Coffee that diffuses like tea when placed in a cup of water is an innovation by Dairy Beverages, Inc., New York. The process by which it is manufactured has not been completely revealed, but it brings the soluble substance out of the cells to make it available for quick solution by hot or cold water; it goes a step further than the process by which coffee extract is made. The latter involves giving the coffee a very mild cinnamon roast so as not to bring the oils to the surface nor damage the cell walls by charring. The coffee is then ground finely and placed in special extraction machines where a vacuum is pulled on it. After sufficient gas has escaped to neutralize the vacuum, deaerated water is pumped into the vessel to effect extraction.

The finished coffee for the balls is packed in small cloth bags closed with a metal clamp, a string being attached for submersion. The product is packed under vacuum, in a pound-size glass jar and a small glass tumbler.

What We Learned About Packaging

Nutty Brown Mills met several packaging problems in launching a new line of cottonseed meal products. From this experience have come facts about packages, as well as ten do's and don'ts of practical value. Pioneering was also done in processing.

By C. A. SEARS
General Manager, Nutty Brown Mills, Houston, Tex.

Small bakers get the benefit of special wrappers at reasonable cost, three large paper companies being under contract to keep ready supply on hand.

AFTER our plant had developed the processing of cottonseed flour and its products, this new type of food was placed on the general market in 1933. Until that time packaging had been given little attention, but with wider distribution it became a serious problem. In overcoming this hurdle, Nutty Brown Mills, Houston, Texas, learned many things about packaging of value to other food manufacturers.

Our experience taught us that the first step in proper packaging is to study the prospective market to determine the correct size before deciding upon a package. When we came out with Nutty Brown macaroni and spaghetti, we decided upon 14-oz. packages. As far as we know, ours was the first commercial dark-colored macaroni and spaghetti. Being of a different type, we thought it should be in a different size package than the familiar type of macaroni and spaghetti, which is generally packed in 7-, 8-, or 9-oz. units.

We wanted to use cardboard folding cartons, but we found there was no such thing as a stock macaroni or spaghetti box. All macaroni and spaghetti manufacturers have their boxes specially made; hence, the many sizes, shapes and designs. With no assurance that the package would sell, we tried another plan. We bought sheets of red paper 18x24 in. in size for wrapping our products. This paper cost us only $5 per thousand sheets. We had a sickly yellow label printed at $4 per thousand and set out to get our first experience in merchandising.

We found that eight out of ten women who picked up the unattractive package would ask if there were a small size available. The 14-oz. package was retailing at 25 cents, but we brought out a 7-oz. size to retail at 15 cents. Our next move was to use cartons made from some left-over stock of green enamel cardboard. They cost $7 per thousand; the labels were $6.50 per thousand in 10,000 lots, and they had to be put on by hand. This label was an improvement over the first one, as it was made from a special plate instead of being an all-print job. The package increased sales further, but it was not yet what we wanted.

We desired to capitalize upon the fact that our product was a protein food, dark in color and different from the usual run of macaroni and spaghetti. It was retailing for twice as much as other types, and we had to have some reason for the difference in price. A carton with a transparent paper window would have turned the trick, but here again we found there was no such thing as a stock box.

OUR third step in packaging the macaroni and spaghetti was to adopt a Cellophane package for the 7-oz. size. The package has proven economical and effective, as it permits visibility and has increased sales. We use this package because of its low cost, but we believe the carton with a transparent window will give better results when all things are considered. We are now putting such a package on the market. It represents our very latest step.

Our ready-prepared muffin flour is packaged in 1-lb. lots. This could be packaged in several ways, but we preferred a carton. Here again, however, a stock carton could not be had, and we could not afford too much experimenting. So we bought a stock-size, satchel-bottom Cellophane bag and had a local concern print it for us. The ink smudged and rubbed off with a little handling, and the bags crinkled with use. A double, moisture-resisting Cellophane bag with the printing inside was tried. On this type of package the printing remains perfect, even with rough handling. Moreover, the double-wall keeps the bag from crinkling. Instead of sealing this bag at the top we twist it pig-tail fashion and seal with red Cellophane tape as an added attraction. If at any time the bag becomes a bit loose or wrinkled, a twist on this top knob smooths it out.

For our 5-lb. household- and diabetic-flour packages we use bags. We first tried plain white cotton bags and stencil marking, which was fairly good but looked crude. Then, too, the flour sifted through these bags enough to make them messy and dusty—rather repulsive to the woman shopper, although incurring very little loss in weight. We finally worked up a design for a two-color, processed, 5-lb. cotton bag, printed in green and brown and inner-lined

Evolution of packages for Nutty Brown spaghetti and macaroni. Package 3, put on the market in past 30 days, is a lap-end carton with a moisture resisting Sylphrap window to retain the display feature of the Cellophane packages. One end lap is printed for macaroni and the other for spaghetti so that same carton can be used for either product.

with an 8-lb. kraft paper bag. These inner-liners cost 96 cents for lots of 500, and the small difference in cost is well worth while. The bags stay clean, there being no sifting, and they stand upright without wrinkling or breaking. This enables the shopper to read easily the trade brand and descriptive matter on the bag. We have also simplified our mail-order business on this size bag by using a small yellow shipping card on which the common baking recipes are printed. This saves much letter writing and the cost of recipe booklets.

BY FAR our major volume of business is with the commercial bakers of this country, with a few in Canada. To these bakers is sold our straight flour to be used in the ratio of one part to eight parts of regular white wheat flour.

Practically all millers pack their bakers' flour in 96- or 140-lb. cotton bags. We supposed we should do likewise. It cost us money to find out that we had made a serious mistake. Wheat flour is sold in carload lots. Naturally, with the contents of the car being wholly flour, the light cotton bags are sufficient. But we sell a flour used only in part for a specialty loaf, and our shipments are relatively small—from 100 to 1,000 lb. for the most part—and our shipments go into nearly all states. Cotton bags will not withstand the freight handling of l.c.l. shipments. We had to turn to burlap bags.

Here again, we ran into some trouble. Burlap bags sift, and they lint sufficiently to introduce foreign par-

ticles into the flour. We solved this by using a kraft paper interliner. These interliners cost us $2.50 per 1,000, plus 4 cents each in ordinary quantities; the price is slightly less in large quantities. But this type of package has received plenty of comment, with not a single complaint from our customers. The burlap does not tear, and being printed in two colors, it is really more attractive than one would think.

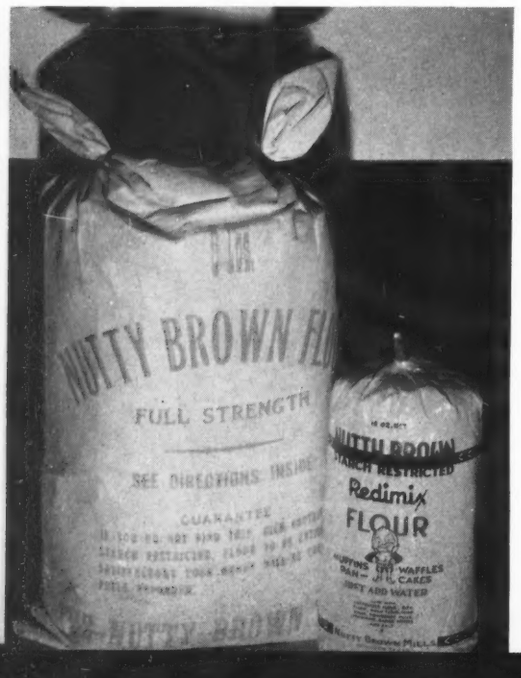
Our connection with the baking trade brought upon us other packaging problems. Bakers licensed to bake Nutty Brown bread contract to use our special wrappers. We first tried stocking these wrappers and shipping them from our office, but this involved delay in delivery and a large outlay of capital. We then licensed three paper houses in the country to make these wrappers and pay us a royalty at the end of each month on all shipped direct to bakers. These firms carry stock wrappers for small bakers and make special runs for large orders.

We have redesigned this wrapper three times, at a cost of $40 to $100 for each new wrapper. Two of the steps were taken because we saw room for improvement—the third, because the health department of one state objected to a single word on the wrapper.

Our experiments have been interesting and educational, although expensive for the small manufacturer. They have taught that we should, if we were to start again, observe these "do's and don'ts":

1. Survey the field to see what size package the average housewife desires.
2. See that the package conforms to all state and federal requirements.
3. Do not attempt to redesign the package every time a food salesman, packaging supply salesman, retail grocer or advertising man comes to us with a hot idea, but be open to suggestions, and go to really big food brokers and get their ideas and reactions on the types and kinds of packages to use.
4. Consider the shipping and handling of packages and their condition by the time they reach the consumer.
5. Display a portion of the product where at all practical.
6. Make the package carry as much needed information about the product as possible to keep down unnecessary correspondence with consumers.
7. Add extra touches to packages where possible to give extra "snap."
8. Provide features which will insure a clean package when delivered to the consumer.
9. Let the packaging material manufacturers assist with designs. Asking for suggestions rather than tell them what is wanted in the way of designs.
10. Make price a factor, but not the determining one, in the selection of a package or type of package. Our experience has been that a little more invested in packages offsets our lack of a large advertising budget.

Nutty Brown flour is packed in printed cloth bags inner-lined with kraft paper to prevent sifting and to give additional strength to the container. Outer bag protects printing on inner bag and adds strength to package. Prepared mixes for home use are marketed in 1-lb., double-walled Cellophane bags.



TO many men in the food field, the story of how the cottonseed processing problems were met and overcome by Nutty Brown Mills will hold as much interest as the development of the packages. By early 1932 such a process had been worked out and the distribution of a highly refined dietary cottonseed flour began.

At first the business was largely mail order. Early in 1933, milling and processing facilities were expanded under the corporate name of Nutty Brown Mills, and an effort was made to reach the average American home with a line of food products made from various blends of cottonseed and vegetable flours. The major portion of the increased output was marketed through the bakery trade, with the first sales effort confined to the Southwest.

THE milling of cottonseed flour is quite different from the processing of wheat or other cereal flours. In the first place, a special grade of prime cottonseed is required to get a flour of the desired uniformity. A seed that will make a 43-per cent prime cottonseed cake produces a flour of approximately 50 per cent protein after final refinements.

The raw cottonseed is first cleaned in reels and shakers to remove dirt and other foreign matter. It next goes to linters, where approximately 20 lb. of lint per ton of seed is recovered; then to a second battery of linters for removal of an additional 75 lb. of lint. From the linters, the seed is conveyed to hullers which discharge hulls to a bin and kernels to a purifier where the remaining hulls are removed. From the purifiers the meats are transferred by screw conveyor to pressure rolls, these operating as a unit of five superimposed rolls. The meats feed from above and pass between each succeeding pair of rolls to come out in the form of flakes approximately 0.011 in. thick. The rolling operation breaks the oil cells of the meats and prepared them for cooking and pressing.

In the stack cookers, four compartments high, the meats start at the top and are routed to the other cooker compartments in a continuous manner. An automatic gate opens at a set period of time for each compartment. Each cooker accommodates approximately three tons, the meats are held 60 min. at 225 deg. F.

From the cooker, the hot meats are routed to the "former" to be compressed into cakes 2x14x32 in. in size under 350 lb. of hydraulic pressure. From the former, the cakes proceed to a battery of hydraulic presses which in five minutes operate through a range of from 0 to 4,000 lb. per sq.in. The cake is under pressure for twenty minutes, giving thirteen minutes for the oil to drain away into pipes that convey it to settling tanks.

The cake is stripped of the press cloth and conveyed to the special curing department where it is stored for twenty-four hours at 70 deg. F. When ready for blending and processing, the cake is placed in the attrition mill and ground to flour fineness. During bolting, all undesirable portions, or tailings, are sent to another department to be made into stock feed, and the acceptable bolted flour is taken to the second blending unit and treating department. Such work is carried on under laboratory control for uniformity.

A ton of selected prime cottonseed used in the manufacture of Nutty Brown cottonseed flour yields approximately 310 lb. of oil, 506 lb. of hulls, 95 lb. of lint, 8 lb. of foreign and miscellaneous matter and 150 lb. of moisture. From this comes about 920 lb. of crude cake, which yields some 600 lb. of usable constituents for the flour blend.

PROMOTING *the Product . . .*

New emblem of the ice cream industry. The two "spoon men" and slogan, "Keep in step—Ice cream for pep," are the creation of International Association of Ice Cream Manufacturers, and are being used in advertising by individual manufacturers. The ice cream companies are urged to outfit two men as the spoon men, using red and blue uniforms, and have them parade on July 4.

▶ ASSOCIATED COFFEE INDUSTRIES OF AMERICA is boosting iced coffee during the summer months. The organization urges coffee distributors to sell the idea to customers, and tells them how to go about it.

▶ WINE INSTITUTE, San Francisco, has issued a folder giving ten simple rules to guide distributors and consumers in the proper handling and care of wine. This is in connection with an educational campaign to end spoilage of wine by carelessness.

▶ INTERNATIONAL ASSOCIATION OF ICE CREAM MANUFACTURERS gets down to the roots of sound merchandising in a letter to manufacturers suggesting that they find out what is wrong with their low-volume dealers. And forms have been printed for retail store analysis, the idea being to find out what is wrong with retailers and help them to remove the trouble.

▶ KNUDSEN CREAMERY CO., Los Angeles, sensing that the name "sour cream" was misleading, has conducted a "best letter" and "best name" competition. As a result, the product will be sold in the future as "cottage cream."

▶ HOFFMAN BEVERAGE CO., Newark, N. J., launched a new radio program June 17 over WOR. Broadcast on Monday and Wednesday evenings, it is a musical program of an informal type. It is titled "Glasses and Song."

▶ SKAGGS & MACLAUGHLIN, Los Angeles, has brought out a new prepared pancake flour and is promoting it through the sale of low-priced griddles.

An automatic griddle for use over a flame stove is being retailed at $2.98, a package of flour going with it. This griddle is illustrated on the package. To promote the flour in restaurants, the company has developed an automatic electric griddle.

▶ PHILLIPS PACKING CO., INC., Cambridge, Md., recently inaugurated a new idea in promotion in the form of an air-mail convention. A series of bulletins sent to stores distributing Phillips products carried addresses by the governor of Maryland, the mayor of Cambridge, the president of the company and the sales and advertising directors. The company is launching a campaign for an increase of 1,000,000 cases over its 1934 volume.

▶ BRAZIL NUT ASSOCIATION did some effective promotional work in the confectionery industry at the recent convention in Chicago. It demonstrated fifteen confections using Brazil nuts in new ways.

▶ FISH AND SEA FOOD INSTITUTE, New York, is advising the people to "Keep cool! Eat fish and sea food in summer." Bulletin No. 54 of its intensive promotional campaign offers the suggestion, "set a cool scene with fish salads," and gives recipes.

▶ KELLOGG CO., Battle Creek, Mich., is offering 437 cash prizes to women for the best letters telling how three friends serve "All-Bran." First prize will be $1,000.

▶ NATIONAL SUGAR REFINING CO. OF N. J. has inaugurated the first consumers' advertising campaign based on the use of sugar as a recipe ingredient. Advertising copy is run two or three times a week. Newspaper comic sections and local radio programs also are employed. The "super sifted, quick dissolving" qualities of "Jack Frost" sugars are stressed.

▶ GORDON BAKING CO., Detroit, will renew at the end of September its Monday, Wednesday and Friday evening broadcast, "The Lone Ranger," over WOR.

▶ STANDARD BRANDS, INC., New York, recently conducted a beauty contest in San Diego in connection with the Pacific International Exposition. Twenty-five of the prettiest contestants are demonstrating Standard Brands foods at the big fair.

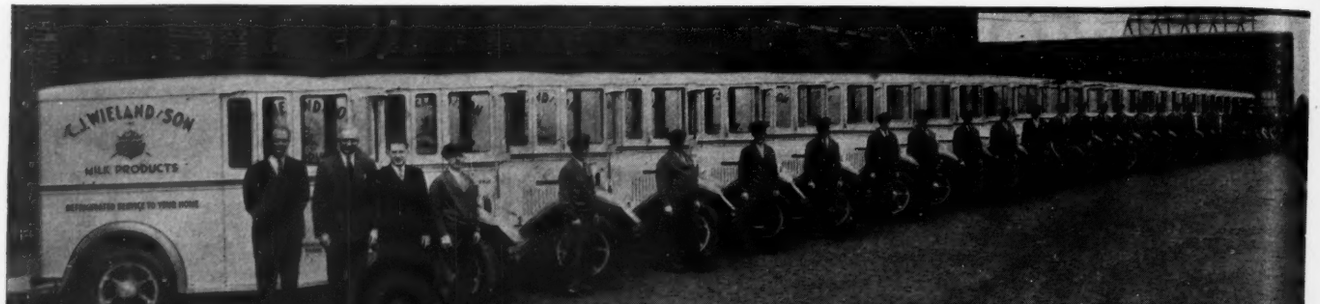
▶ KRAFT-PHENIX CHEESE CORP., Chicago, now is using "advertising caps" on its "Miracle Whip" salad dressing pint and half-pint jars. These caps feature "Ham-N-Aise," "Miracle Whip Sandwich Spread" and "Miracle French Dressing." The company has a large exhibit at the San Diego fair.

▶ SEEMAN BROS., INC., New York, have gotten out an effective new ad with the slogan, "If it's White Rose, you can be sure it's good."

▶ MEAT PACKERS have been ordered by the Interstate Commerce Commission to remove all advertising from the sides of refrigerator cars. The 10,000 leased and owned cars in service for the packers must have all the ads removed by Jan. 1, 1937, and after that time bear only standard identification marks.

▶ CONTINENTAL COFFEE CO., Chicago, is using a small coffee grinder as a premium for its "Natur Fresh" line.

▶ CLYDE (Ohio) KRAUT CO. has gotten out a folder listing advantages and uses for "Silver Fleece" sauerkraut juice.



The fleet of 30 refrigerated-body retail milk route trucks recently put into service by C. J. Wieland & Son, Inc., in Chicago. The refrigerant used is dry-ice. The truck chassis are standard Model M-2, low-aisle Internationals and the refrigerated compartments were designed by Harvester company engineers. The three men at the left are, from left to right, H. G. Wieland, C. J. Wieland, and D. A. Tannler.

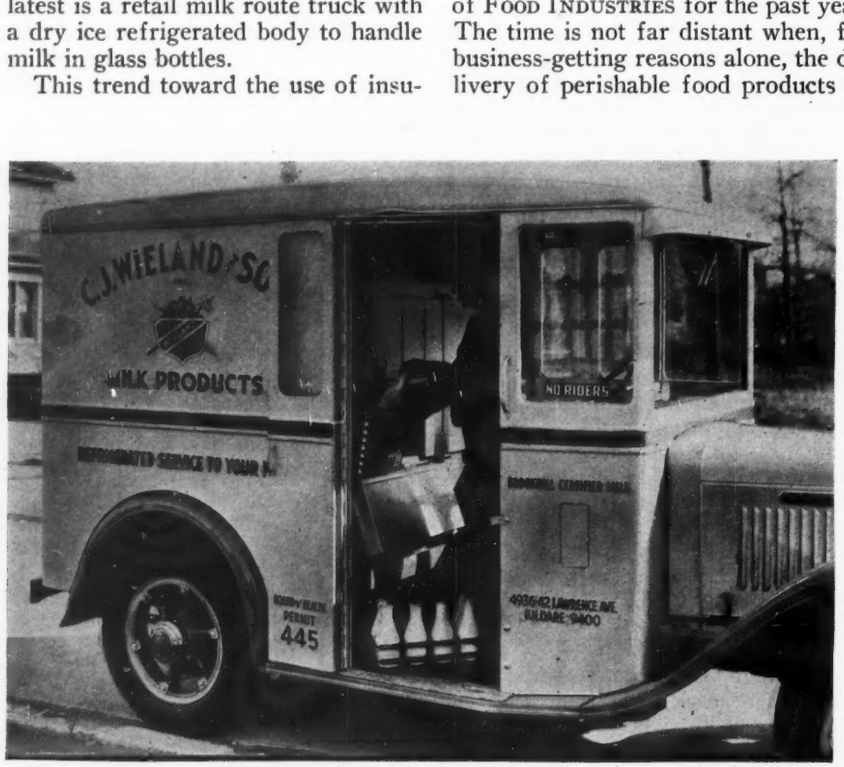
Refrigerated Milk Delivery

Chicago dairy uses dry ice bodies for milk in glass bottles

TIMES are surely changing in the handling of food products by automotive equipment. The latest is a retail milk route truck with a dry ice refrigerated body to handle milk in glass bottles.

This trend toward the use of insulated or refrigerated bodies for food products has been reported in the automotive pages of almost every issue of FOOD INDUSTRIES for the past year. The time is not far distant when, for business-getting reasons alone, the delivery of perishable food products of all kinds whose condition is affected by a considerable rise in temperature in the hot summer months will be done through the use of some form of insulated or refrigerated motor truck bodies.

With the advent of the mechanical refrigerator or cabinet, the use of ice and salt to keep ice cream in condition during delivery began to pass out and the refrigerated ice cream truck body pioneered the field. Next as a group, the dealers in prepared and ready-to-eat meats embraced the refrigerated truck body.



Close-up of the refrigerated compartment which is 58 in. wide; 52 in. high and 54 in. deep. It holds 24 cases of milk. An additional six cases for first delivery may be carried below the compartment, giving the body virtually a 30-case capacity. The dry-ice bunker is on top of the compartment but inside the truck roof which carries 1 in. of insulation.

THEN progressive truckers for hire, seeing the business getting advantages of such bodies, began to install medium and low-temperature refrigeration units to guarantee the delivery in good condition, even over long distances of up to 1,000 miles, of food products such as fresh oysters, frozen fish, meats, fruits and vegetables, cheese, butter, eggs and poultry and many other miscellaneous items.

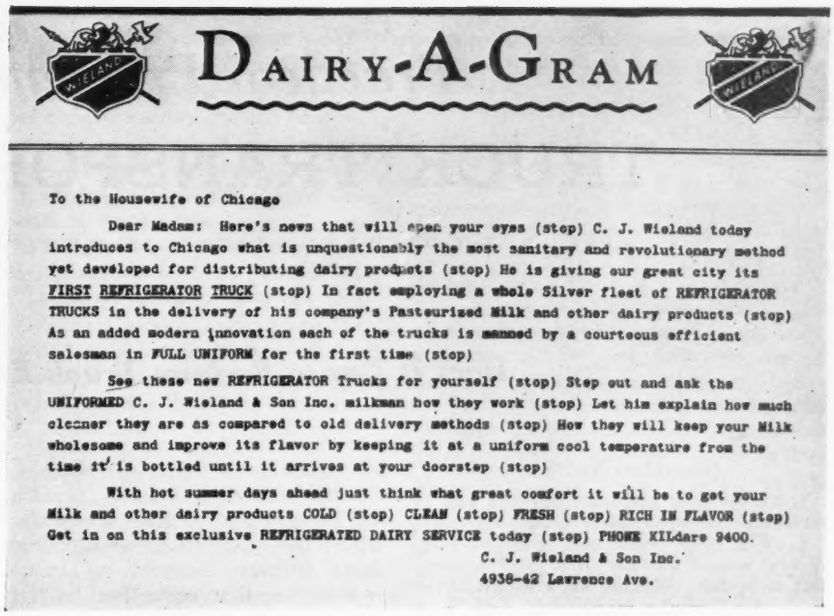
But with the exception of the Silver Seal refrigerated body, described on page 22 of FOOD INDUSTRIES for January, 1935, and the Dairy Sealed insulated body described on pages 192 and 193 of the April, 1935, issue, in both of which cases the milk was carried in fiber containers, the retail milk

industry has clung to cracked ice until the advent of the dry ice body illustrated herewith. The introduction of this body thus marks a distinct step forward and may eventually revolutionize the method of retail milk delivery.

The new body expresses the ideas of C. J. Wieland, long prominent in the dairy industry in Chicago. On Feb. 11 of this year, he purchased the Glenview Dairy Co. which at that time operated thirteen routes on Chicago's north side.

The several makes of Glenview trucks were replaced by a fleet of 30 International step-in-drive Model M2 trucks, each with its refrigerated body. By the end of May, the business had increased so that all 30 of the trucks are now operating on routes on the north side and northwest sections of Chicago including the suburbs of Evanston, Wilmette, Winnetka and Park Ridge.

Mr. Wieland has associated with him his son H. G. Wieland, as vice-president, and D. A. Tannler, as secretary and treasurer. The business is conducted under the name of C. J. Wieland & Son, Inc.



DAIRY-A-GRAM

To the Housewife of Chicago

Dear Madam: Here's news that will open your eyes (stop) C. J. Wieland today introduces to Chicago what is unquestionably the most sanitary and revolutionary method yet developed for distributing dairy products (stop) He is giving our great city its FIRST REFRIGERATOR TRUCK (stop) In fact employing a whole Silver fleet of REFRIGERATOR TRUCKS in the delivery of his company's Pasteurized Milk and other dairy products (stop) As an added modern innovation each of the trucks is manned by a courteous efficient salesman in FULL UNIFORM for the first time (stop)

See these new REFRIGERATOR Trucks for yourself (stop) Step out and ask the UNIFORMED C. J. Wieland & Son Inc. milkman how they work (stop) Let him explain how much cleaner they are as compared to old delivery methods (stop) How they will keep your Milk wholesome and improve its flavor by keeping it at a uniform cool temperature from the time it is bottled until it arrives at your doorstep (stop)

With hot summer days ahead just think what great comfort it will be to get your Milk and other dairy products COLD (stop) CLEAN (stop) FRESH (stop) RICH IN FLAVOR (stop) Get in on this exclusive REFRIGERATED DAIRY SERVICE today (stop) PHONE KILdare 9400.

C. J. Wieland & Son Inc.
4938-42 Lawrence Ave.

The unusual business-getting circular used to tie up the introduction of the new C. J. Wieland & Son, Inc., refrigerated trucks with fully uniformed driver salesmen. The drivers distributed the circulars to the back doors of prospective customers over all their routes.

ALONG with the dry ice body came two other innovations, the use of cloth uniforms for the driver salesmen, and a unique form of advertising called the Dairy-A-Gram as shown in the illustration at the top of this page. As shown in the other three illustrations, the uniform consists of ventilated visor cap; a blouse with a zipper front and trousers of the same cloth material. A clean shirt with a black four-in-hand tie completes the uniform, which is dry-cleaned and pressed every ten days. The refrigerated compartment in the truck body was designed by the engineers of the Springfield, Ohio, truck works of the Harvester company. It extends crosswise of the body from the drivet's aisle to the rear and holds twenty-four regulation 12-qt. wooden cases of milk. While it extends for the full width of the body and to the rear from the driver's aisle, it does not extend to the roof or to the floor.

The space between the top of the compartment and the roof of the truck body is utilized to locate the dry-ice bunker and for carrying nine cases of empty returned bottles which of course require no refrigeration. The space below the bottom of the compartment and the floor of the truck can be utilized to carry six cases of full bottles of milk or as many cases of empties.

The space between the bottom of the compartment and the body floor is fitted with sliding doors and may be used to hold milk to be delivered on the early portion of the route before it has an opportunity to increase in temperature.

The dry-ice bunker has a capacity of 50 lb. and is filled from the driver's aisle. The bunker is mounted on the top of a conductor plate which forms the ceiling of the refrigerated compartment. Charging the bunker with 50 lb. of dry-ice will keep the temperature in the compartment at 40 deg. F. or lower even on the hottest summer days.

The compartment is divided horizontally into two parts, each furnished with two insulated doors to handle the cases of milk in and out. The two top doors are hinged to swing upward and the two lower doors, downward.

One of the refrigerated body trucks which are painted silver aluminum. Note also the low-step aisle; the two-part folding door and the cloth uniform worn by the driver salesman.

Practical Problems of
TRUCK TRANSPORTATION

DISCUSSED BY EXECUTIVES IN THE FOOD INDUSTRIES

Does It Pay to Reclaim Truck Engine Oil?

Question No. 11

1. Under what conditions does it pay to reclaim or re-refine motor truck engine oil?

2. In a large truck fleet operated from several branch garages, is it more economical to reclaim such oil on a decentralized basis by the use of a small reclaiming outfit in each garage than to employ one large machine in the most centrally-located garage?

3. What, in your opinion, is the most satisfactory method to follow in relation to the principle of operation of the reclaiming machine?

4. In reclaiming truck engine oils, does it pay to go to the additional expense of lightening the color of the reclaimed oil if it is satisfactory in other respects as to specifications?

Savings With Own Reclaimer

THE Produce Division of the Borden Sales Co., Inc., New York City, believes in the economy of reclaiming the oil removed from the engines of its motor vehicle equipment. In this operation, it has joined with the Ice Cream and Fluid Milk Divisions of the Borden Company in the metropolitan area to have practically all of the oil removed from the engines of the trucks and passenger cars of all three divisions reclaimed by an outside, independent oil reclaiming company, the International Oil Re-refining Co., New York City.

The aforementioned company deposits an empty oil drum at each of the Borden stations at which trucks and cars are maintained. When these drums are filled with crankcase drainings, the company picks up the full drum and leaves another empty drum in its place. The full drum is then transported by truck to the company's reclaiming plant in New Jersey where the oil is re-refined and returned to the station where it originated at a total cost of slightly more than one-half the cost per gallon of new oil.

The drainings are re-refined to practically the same specifications, including color, as those of the original oil. As each barrel of crankcase drainings is tagged with the Borden name and station from which it originated and as this oil is run through the reclaiming machine in individual batches, the Borden station gets back its own oil and none of that of other companies for which the reclaiming company may be doing business.

Believing that more than half of the cost paid for reclaimed oil when re-refined at a plant some distance from the points at which the drainings originate, is in the cost of transportation in picking up and delivering the oil, one of the Borden subsidiaries just outside the metropolitan area installed its own reclaiming machine more than a year ago. This machine, a Skinner "Stream-Line" oil filter, such as described on page 367 of FOOD INDUSTRIES for August, 1934, proved very satisfactory.

The out-of-pocket cost for reclaiming the oil by the Skinner machine for oil originating in the same garage as that in which it is re-refined, is much less than that furnished by the independent company in the Metropolitan area. Accordingly surveys are now being made to determine if similar installations at points of large truck and car concentration will result in a lower unit cost per gallon because of the absence of transportation charges.

In the computations in connection with the above costs, the main aim is to provide the machine with a sufficient volume of oil to be reclaimed to keep it in continuous operation. From then on it is merely a question of mathematics to determine whether a centralized or decentralized operation is the most economical.—Jos. HUSSON, *automotive superintendent, The Borden Sales Co., Inc., Produce Division, New York, N. Y.*

Pays With Good Oil

WE TAKE your questions on the subject of reclaiming truck engine oil in order, and answer them as follows:

1. It pays to reclaim oil only when the best oil is used.

2. It is much more economical to reclaim at a centralized plant, using one large machine; that is, if the local fire department rules will permit it.

3. The cost to the user reclaiming his own oil would be far in excess of having it done by a specialist. If we were to reclaim our oil in the same manner as a specialist does it, analyzing each lot, the cost would be far in excess of what we now pay the International Oil Company.

4. Lightening the color is unnecessary since it is not for resale. The color makes no difference in the quality. After reclaiming, the oil is better because of the additional number of times it has been refined.—E. JOHN DUGAN, *general manager of transportation, New York Dugan Bros., Inc., Brooklyn, N. Y.*

Purchases Refined Oil

IN REPLY to your question as to whether or not it pays to reclaim truck engine oil, we do not use a reclaiming unit, but purchase the refined oil from a commercial concern.—ELZA HAWKINS, *general manager, Good Humor Ice Cream Co., of Los Angeles, Inc., Los Angeles, Calif.*

Color Restoration Unnecessary

IN ANSWER to your questions regarding oil reclaiming, our answer to question No. 1 is that it pays to reclaim oil in almost any fair-sized fleet.

Next Month's Question

QUESTION NO. 12

Is preventative motor truck maintenance worth while?

1. Does it pay to set up some form of preventative motor truck maintenance in the operation of a fleet in the food field?

2. Of what should this preventative maintenance consist?

3. Are periodical inspections the backbone of what you consider adequate preventative maintenance to be?

4. If so, at what mileage or time intervals should such inspections be made?

5. What records or paper-work do you consider are essential to follow through on the procedure of preventative maintenance that you favor?

2. If the branch garages are in the same city, it would seem that it would be better to reclaim the oil at one point.

3. Where the reclaimed oil is going to be used by the same fleet, it seems that all the reclaiming machine has to do is to remove dirt and volatile liquids.

4. We do not think it is necessary to restore color where the reclaimed oil is not put out for sale.—M. COHEN, *industrial engineer, Schulze Baking Company, Kansas City, Mo.*

Oil Reclaiming Unjustified

WE HAVE given considerable thought to the matter of reclaiming truck engine oil.

I have seen a number of samples of reclaimed oil and have seen a number of oil reclaiming plants, but have not been convinced that the reclaiming of oil is the proper thing to do. I feel quite strongly about this, particularly where a concern has high-priced equipment, such as ours.

If the price of lubricating oil were considerably higher it would be worth, in our minds, more serious consideration; but with the low prices which we have had for some time on oil, I do not feel that there is sufficient monetary saving to justify a concern such as ours using reclaimed oil.—PAUL E. FERBER, *Hoffman Beverage Company, Newark, N. J.*

Does it pay to retread tires?

Question No. 9

1. What are the determining factors which should be considered in retreading pneumatic truck tires?

2. What effect has the size of the tire upon the economy of retreading?

3. What effect have truck road speeds and percentage of tire overloads upon the determination to retread?

4. What is the relative merit of retreading the tread only as compared with carrying the retreading down both side walls of the tire to the beads?

5. Under what operating conditions are retreaded tires more likely to blow out than new tires?

6. What additional mileage, in percentage of new tire mileage, should a retreaded tire be expected to give under normal road speeds with the tire overloads not in excess of 10 per cent?

7. What method or process have you found to give the most satisfactory results for tire retreading?

Retreads on Short Hauls

SO FAR we have not had a great deal of experience with retread tires. However, it seems that it is important to pick out only those casings that have completed their first mileage in a short period of time so that the carcass has not had a chance to deteriorate from weather conditions and moisture. Also, the carcass must show no signs of any defects that might have been caused by stone bruises, etc.

Our experience has been limited entirely to the smaller truck tire sizes. Therefore, we have nothing to offer as to what economies may be made by retreading anything larger than a 34x7 high pressure tire or a 8.25x20 balloon.

We have found that country driving, where the vehicle is traveling at fairly high speed for an hour or two at a time has had some ill effect upon retread tires, perhaps because of the extra amount of heat produced within the casing. However, for short runs, city and plant operation, we have found them to be entirely satisfactory; and they will produce nearly the same number of miles that a new casing of like size will produce.

In our experience we much prefer the retreading to follow down the side walls of the tire to the bead. Our experience with renewing the tread only is not so satisfactory, inasmuch as we had some cases where the tread separated from the old carcass. This, however, was not experienced where the retreading was carried down the side walls.

In summing up the value of retread tire equipment, we believe that the use of such equipment should be confined to short haul work; tires to be put into service where they are not to carry more than a 10 per cent overload, and only tire carcasses be used for retreading purposes that have produced their first mileage within a year's time or less; that if such tires are used in long-distance hauling, they be used only in the season of the year when the outside temperature is low and the heat within the tire caused by friction is at a minimum. —R. F. GRAY, *Transportation Department, Geo. A. Hormel & Co., Austin, Minn.*

Likes Hawkinson Retreads

IN THE retreading of truck tires, our experience has been as follows:

The most important factor in determining the success of retreading tires is that you get a good carcass and have it examined thoroughly by a reputable retreader for cuts in the fabric, and to determine if the tread on the tire has become loosened in service and if the life of the tire has been burnt out by overloading.

We have not been able to see what effect the size of the tire would have upon a properly applied new tread.

In our estimation, a new tire will give much greater mileage than a retread where you have speed and overload factors with which to contend. We do not believe there is a saving on this type of service. Of course, there might be a saving where the speed is moderate and the tires are of sufficient size to carry the load.

One of the principal problems that the tire manufacturers have had has been to build a tire with as little heat as possible. The material that goes into a tire, both rubber and fabric, gets its tensile strength from the natural oil. When subjected to excessive heat, this material is dried out and is not as strong as it was originally. In the retreading where a part of the side walls and the entire tread is removed from the tire it is necessary to use a steam bag filled with live steam inside the tire and a steam mold outside the tire, in order that the heat will go through the fabric and get proper adhesion between the new tread and the fabric. By this method the fabric is again subjected to as much heat if not more, than when the tire was built originally. This naturally takes a lot more of the life out of the fabric.

In the winter, retreads will run fairly well, because the matter of heat is unimportant. However, retreads operating in the summer get to a temperature where the fabric will no longer carry the load and the tire blows.

Under normal road speeds, a retreaded tire should give about 65 per cent of a new tire mileage with tire overloads not to exceed 10 per cent.

We have found the Hawkinson method to be the most successful method of applying retreads.—R. P. MIRO, *Ballard & Ballard Co., Louisville, Ky.*

REALIZING the many and varied problems of motorized transportation which are constantly arising in the handling of all kinds of food products the editor will be glad to receive suggestions as to what are the particularly pressing problems that readers would like to have discussed in these pages.

It is also hoped that readers of these pages will note the publication of the question that is to be discussed next month, and add to the completeness and usefulness of the discussion by sending in answers from their own experience.

Small Retreads Successful

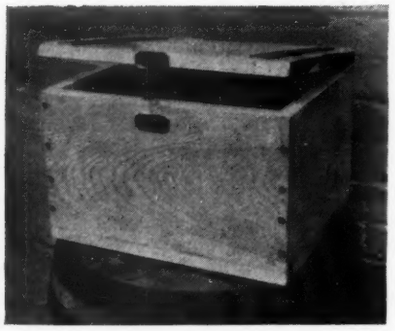
WE HAVE very few heavy trucks and they are used so little that tires seem to last indefinitely. We therefore do not have the problem of retreading.

Some years ago, when tires were more expensive, we did retread certain tires on ¾-ton panel cars on the Pacific Coast, and found them quite satisfactory. Since that time there has been much improvement in the retreading process; and from such information as we have received from outside sources, it seems as though it is entirely satisfactory to retread the larger tires. Just how they stand up after this work is done, though, under any particular stress or strain, we are unable to say.—C. L. JONES, *Automobile Division, General Foods Sales Co., Inc., New York, N. Y.*

IDEAS
from Practical Men

Butter Boxes Save Cartons

TO AVOID wasting cartons on "split" orders of butter, Vogt's Ice Cream, Inc., New York City, has constructed a number of pine delivery boxes. Into these boxes go all orders less than 30 lb., and before being loaded into the trucks, the orders are refrigerated with small pieces of solid CO_2. With this system of handling, not only is there a saving in cartons, but the small orders are prevented from jostling around in the truck and suffering damage. Of course, the butter is kept in excellent condition with the aid of the "ice." The box used has a hinged cover with a fastener on the front. It is lacquered and white enameled inside and painted with aluminum paint outside to reflect heat. The box shown here is just completed and has not yet been painted.



Butter box, before painting.

Paper Ice Cream Cans

METAL ice cream cans are being replaced by paper containers by one of the large ice cream manufacturers of New York City. These new containers are found to be satisfactory because drug stores and other customers had acquired the habit of using the metal cans for such odd purposes as cooking soup. Naturally, after all the tin coating on the can has been worn off by the soup, or from some other cause, the customer had no further use for it and returned it; but it was then of little use to the manufacturer.

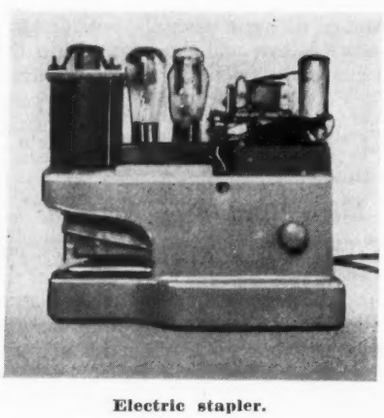
Other advantages of the paper container are that it eliminates can washing, does away with "returns," and reduces the weight of deliveries. On the other side of the ledger, however, the manufacturer finds that the paper containers cost more and that somewhat more time is required to harden the ice cream in them.

Experiences of this company with paper cans may be enlightening to others. The first style that was used had a bottom flush with the sides. Occasionally, these containers froze fast into the dealer's cabinet, and sometimes the bottom would be pulled out before the can would break loose. This trouble was obviated when the company adopted a can with a metal rim which projects below the paper bottom and prevents it from touching the cabinet. This container, however, is tapered, and the manufacturer is now experimenting with a straight-sided can with the same type of bottom rim. One objection to the straight-sided can is that it must be set up at the ice cream plant, while the tapered can, which can be stacked in "nests," is delivered ready to use.

Electric Stapling Device

PURVEYORS of potato chips, nuts, candies and other foods commonly sold in transparent bags, will find interest in an electric stapling device recently developed by a Los Angeles electrical engineer. This device drives staples by converting ordinary 110-volt alternating current.

Developed experimentally, the device is non-patentable because of the radio tubes used. Consequently, the inventor is not marketing it commercially. However, he states that a study of the illustration will enable any competent electrical engineer to build a superior stapler, the speed of which is solely dependent upon the skill of the operator employed. The machine will drive up to 5,000 staples per minute, or can be regulated to drive one every five minutes.



Electric stapler.

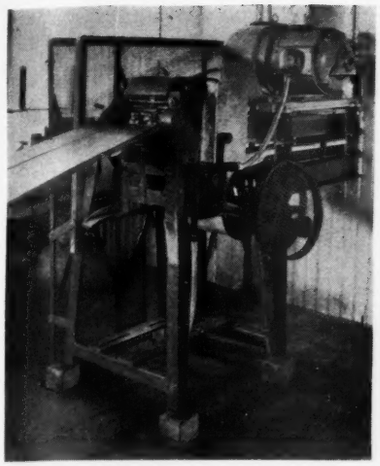
The construction is as follows: A condenser and a relay are mounted on a transformer, as shown, and the rate of speed is regulated by the control button on the side, which is similar to that employed in raising or lowering power in a radio receiving set. The impulsion from the relay governs the speed, making contact with a post mounted by the side of the condenser.

Power is sent to the electro-magnet mounted at the front. This drives down the arm. The hand button of any ordinary stapler is placed beneath this arm in the crotch which extends over the table edge where the operator works. Thus the staples are driven with the driver coming to rest at the top after each stroke. The immediate return eliminates the pause which slows the speed of mechanical staplers. The relay operates constantly. The stapler is operated by means of a foot pedal, the operator merely holding his foot upon the pedal. When in use the parts shown in the photo are protected by a shield.

Variable Speed Drive

BY INSTALLING a variable-speed motor drive upon a rotary die cutting candy machine in the factory of Edgar P. Lewis & Sons, Inc., Malden, Mass., a wider range of products has been made available from this unit. Formerly it was driven by a 2-hp., constant-speed motor mounted on the steel framing shown in the picture. To enlarge the range of the machine a 2-hp., 550-volt, three-phase induction motor was substituted on the same mounting, even to the bolt-holes.

The new motor speed range is 1,200 to 600 revolutions per minute, with an across-the-line starter and variable drive through Diamond



Variable-speed motor drive installed on a rotary die cutting candy machine.

chain, as shown inside the screening to safeguard operators. The motor design is of the dust-proof type, which contributes to the cleanliness of production essential in the modern candy factory. The outfit has a fine range of speed control. A candy dog 2 in. long requires a slower speed than a teddy bear $\frac{3}{4}$ in. long, so that a smoothly graded speed control is highly useful.—H. S. KNOWLTON, *Boston, Mass.*

Portable Pipe Cleaner

THE WORK involved in the cleaning of the sanitary piping in its large packaging plant has been minimized by Pioneer Ice Cream Brands, Inc., New York, N. Y. This plant uses a motor-driven brush mounted on a cleaning tank equipped with casters. This may be rolled from place to place, thereby avoiding carrying the pipe long distances. And to accompany the portable cleaner is a caster-mounted rack made of angle iron and provided with hooks for carrying several lengths of the pipe.

Auto Rim Supports Hose

TO KEEP hose off the floor when not in use for plant cleaning, John Morrell & Co., Brooklyn, N. Y., has found sections from the rim of an old wire automobile wheel to be effective. The rim is of the flat, not drop-center type, and it furnishes a wide gently curving surface over which the hose may be looped several times without damage to the rubber or fabric. The rim segment is mounted on a post about 4 ft. above the floor, being bolted to a metal strap which passes around the post. Two holes drilled in the lip of the rim receive the bolts.

Barrel Rest

THE barrel shown in the accompanying illustration contains oil for mixing with dipping chocolate. Before the barrel rest shown was made, this barrel was supported on a box with blocks, a rather makeshift arrangement.

An employee suggested the iron stand, and it has proved to be very satisfactory. It is made of 1 in. x 2 in. channel iron and 1 in. angle iron—shaped, welded and painted. The oval is made expressly to fit the barrel. The height is made suitable for drawing off the oil and yet is an easy lift from a hand truck when changing barrels.—AL SUTTON, *Kansas City, Mo.*

Filling Jars

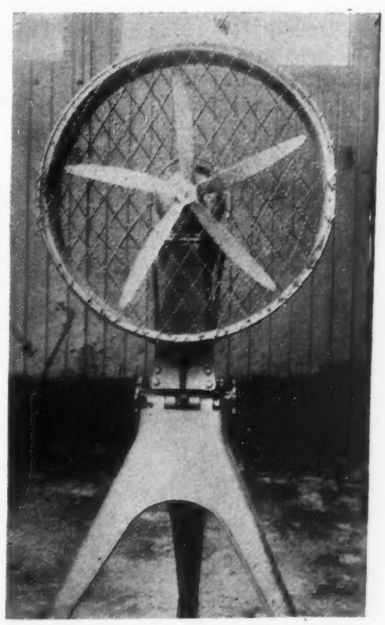
MANY plants cannot use an automatic machine for placing syrup, brine or vinegar in jars of preserved products because their volume is too small, or the product is of such a nature that it would be damaged by the nozzle of the filling machine.

One large packer of pickled products gets around this difficulty by using a special nozzle on the hose which is the usual means of hand-filling such jars. This hose is equipped with the usual hand-controlled valve. Attached to the outlet is a small-diameter tube of metal resistant to the corrosive action of the vinegar. This tube is bent at right angles to the direction of the hose and the portion that is bent over is somewhat longer than the depth of the jars to be filled.

In operation, the worker carefully inserts the tube into the jar, which has already been filled with the pickled product in such a manner that it extends down along the side of the jar to a point near the bottom. In inserting the tube, it can be moved around in such a way that it does not bruise or damage the product in any way.

The valve is then operated, and the jar filled with vinegar, without the formation of any air bubbles, which would be present if the jar were filled from the top.

This iron stand supplanted a makeshift support of a box and blocks.



Fan for hardening room.

Fan Cuts Hardening Time

WITH the portable fan shown in the accompanying illustration, one ice cream manufacturer cuts the hardening time by 10 per cent. This is an important saving in the summer months when plant facilities are crowded.

To achieve this higher rate of production entails no great expense, for the fan is driven by a $\frac{1}{4}$-hp. motor. The fan is of the propeller type, with five blades, and it operates at 1,750 r.p.m. It is enclosed in a cage and is mounted on trunions so that it may be tilted. So satisfactory has this portable fan proven that the company plans to install a "permanent" fan in one of its two hardening rooms. This unit will be of smaller capacity, however. The temperature in the hardening rooms is —15 deg. F., and the rooms measure 25x20x12 ft.

Incidentally, in addition to speeding production, an increased rate of hardening tends to improve the texture of the ice cream by reducing the size of ice crystals formed at the low temperature.

NEW EQUIPMENT
for Food Manufacturers

Rack Washer

FOR washing racks in food plants, Latendorf Conveyor Corp., 61 Oak St., Bayonne, N. J., announced a rack washer. This device is 12 ft. 5 in. long by 4 ft. wide, and 7 ft. 11 in. in height. Pipe connections used are 2 in. for drain lines, 1 in. steam and hot water connections, larger if available. Motor is 1½ hp. Solution and sump tanks are of galvanized metal; while side walls, roof and door are of Toncan iron. Valves, piping, bolts and other accessories are also made of corrosion resistant material. This washer is said to thoroughly clean and sterilize a rack in ten minutes.

Magnetic Brake

A DISK BRAKE of magnetic type for floor or motor mounting, called the "Stearns" high duty style DS, is offered by Magnetic Manufacturing Company, Milwaukee, Wis. Five sizes are available, ranging from 10 to 90 ft. lb. torque, for continuous duty operation. Features of this brake are said to be manual release, lining wear indicator, constant torque provided at all times and not subject to variation from lining wear, simple and practical adjustments for torque and lining wear, and easy replacement of linings when desired. These brakes are furnished with or without adapter for motor mounting and are offered in marine finish, water resisting and waterproofing, if necessary. Special provision can also be made for through-shaft applications.

Cereal Cooker

CEREAL COOKERS fabricated from stainless-clad steel are now being produced by Waterous, Ltd., Brantford, Ont. These cookers are approximately 6 ft. long by 4 ft. in diameter and are of the revolving type. In them the cereal is cooked by the application of live steam in the presence of salt. Because the combination of hot wet cereal and salt has an extremely corrosive action on ordinary metals, the cooker shells are fabricated by all-welded construction from IngAclad 18-8 stainless-clad steel produced by Ingersoll Steel & Disc Co., 310 South Michigan Ave., Chicago, Ill.

Dairy Trucks

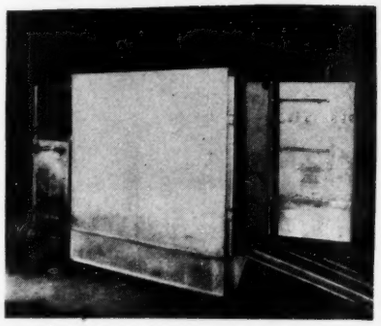
A NEW model truck for the handling of long distance shipment of dairy products has been brought out by International Harvester Co., 606 South Michigan Ave., Chicago, Ill. This truck is of the new 3-ton International model and is designated Type C-40. The body, shown in the accompanying illustration, has been specially designed for ice cream haulage.

Automatic Hose Valve

TO PREVENT leakage from hoses and conserve water, Hunt Manufacturing Company, 1619 Winona Avenue, Chicago, Ill., has developed an automatic hose valve for attaching to any free-end hose or overhead washer. This device has a brass female connector, threaded to fit any standard water hose connection. The valve is replaceable and is provided with a 6-in. length of ¾ in. diameter gum rubber connection. In operation, when the hose is taken in hand it automatically releases the valve permitting the water to flow; when the hose is returned to its normal position hanging from an overhead washer or lying on the floor, the water pressure closes the valve and positively shuts off all water flow.

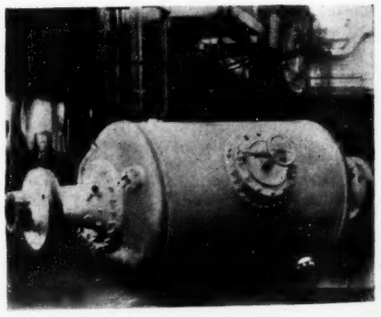
Fire Extinguisher

PYRENE MANUFACTURING COMPANY, Newark, N, J., announces a new 2-quart vaporizing liquid fire extinguisher that is discharged by air pressure and delivers a fan-shaped spray as well as a solid stream. This extinguisher is known as the Pyrene 2-Quart Pressure Type and is recommended for use with incipient fires in all classes of material, and especially for inflammable liquids and electric fires. The air pressure is obtained from any compressed air line having a pressure of 100 lb. or more. The device weighs 16½ lb. when fully



Rack washer.

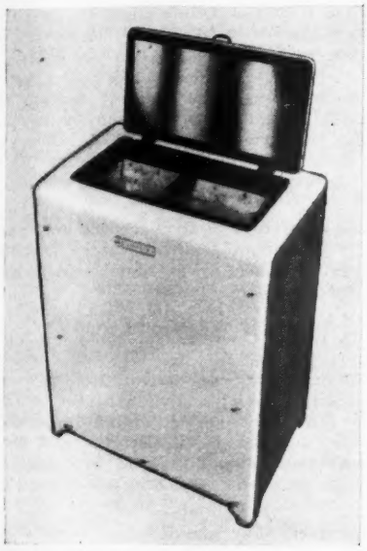
Magnetic disk brake.



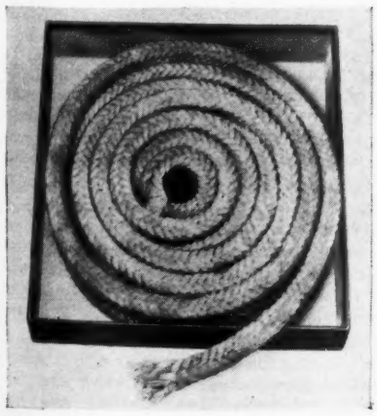
Stainless-steel-clad cereal cooker.

Truck for long distance hauling of dairy products.

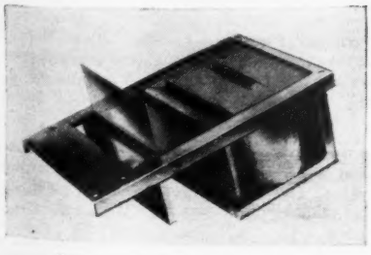
New Reo speed truck.



Small ice cream cabinet.



Lubricated packing.



Spout—magnetic separator.

charged, is 18 in. high and 5 in. in diameter. It is operated merely by opening the operating valve on the top of the extinguisher and controlling the combination discharge nozzle.

Ice Cream Cabinet

A NEW design of ice cream dispensing cabinets for use where maximum storage space is required but small cabinets must be used, has been developed by Kelvinator Corp., Detroit, Mich. It is called the "Kelvin Chest." This cabinet is 29 in. wide, 36 in. high and 19 in. deep and accommodates two 2½ gal. cans of bulk ice cream or 7 to 8 gal. of ice cream in packages and novelties. It is heavily insulated and is equipped with standard Kelvinator equipment.

Lubricated Packing

FOR USE in packing pumps handling water and other liquids in food plants which might be contaminated by oil or grease, Greene, Tweed & Co., 109 Duane St., New York, N. Y., have developed a packing called "Klero." This is a lubricated packing of square-braided type and is lubricated with an odorless, tasteless and stainless substance which can safely be used in contact with food products.

Sealed Capacitors

A NEW line of hermetically sealed power capacitors, about one-half the size and one-third the weight of the conventional oil sealed units, has been developed by Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. The range of sizes available is from 5 kva. at 230 volts up to 1200 kva. at 6,900 volts. It is claimed for these capacitors that because of their compact, light weight and seal-proof design, they expand the economical use of power factor correction in industrial plants.

Magnetic Separator

FOR use in the grain and milling industries, Magnetic Manufacturing Co., Milwaukee, Wis., offers their high speed Stearns high duty magnetic separator of spout type. This machine is designed for removing tramp iron from grain and cereal products and is for installation in the chute or spout through which these cereal products are handled. The manufacturers claim that with this machine tramp can be removed without restriction or limitation under normal operating conditions and they further state that it is the only machine so far given unrestricted approval by the Mutual Fire Prevention Bureau.

New Speed-Wagon

GUARANTEED performance, based on Reo's exclusive ability rating system, is stressed as a feature of the new Speed-Wagon together with ample loading space and payload capacity and correct load distribution.

In design these new Speed-Wagons have streamlining closely approximating that of the ½-ton commercial car and the 1½-ton truck introduced last Fall. The motor is the Reo 6-cylinder "Silver Crown" and has an N.A.C.C. rating of 24.3 hp. The brake hp. at 2800 r.p.m. is rated at 70. There is a 4-speed truck transmission and the tires used are 6.00x20 with dual rear tires available at extra cost. Two wheel bases are provided—139 in. and 166 in., and the Speed-Wagons are available in a variety of standard bodies for different trucking purposes.

Time Cycle Control

A CONTROL INSTRUMENT for the automatic, intermittent operation of diaphragm valves or other diaphragm-operated devices has been developed by Taylor Instrument Companies, Rochester, N. Y. This device is called the "Taylor Intermitter" and differs from other time cycle controllers made by this company in that it is limited to the repetition of a single operation. Simplicity is claimed for this design, bringing the advantage of a small number of moving parts and consequent freedom from trouble, and long life. The operating mechanism consists of a circular cam on which a suitable number of actuating lugs may be placed. The number of these lugs corresponds with the number of operations being performed during the rotating of the cam and as many as twenty lugs may be used. The duration of each operation is adjustable by moving the bracket carrying the nozzle so that its scribe mark is opposite the desired time interval on the scale. The higher the position of the nozzle the shorter the period of nozzle closure and the consequent duration of the operation. By this means it is possible to make any change in either the number or duration between operations without replacing or cutting the actuating cam.

Drive is by means of a spring-driven clock available in one-hour, six-hour and twenty-four-hour periods of rota-

tion. Electrical-driven clocks with identical periods of rotation can also be supplied. The instrument is available in two types: the first is reverse acting, lugs to close nozzle applying pressure to diaphragm motor; the second is direct acting, lugs to open nozzle relieving pressure from diaphragm motor.

The "Intermitter" can be mounted on any diaphragm motor or in any adjacent location. A waterproof aluminum case with black finish is provided for protecting the mechanism. The pressure gages are located within this case to protect them from breakage and discoloration. An over-pressure release protects the diaphragm motor from excessive pressures in the event of reducer valve failure. Either compressed air or gas at a constant 25 lb. per sq.ft. pressure is specified for this instrument.

Barrel Pump

A HIGH-PRESSURE, air-operated barrel pump has been introduced by Alemite Corporation, Chicago, Ill. This is designed to convert any original 100-lb. lubricant container into an efficient power-gun for industrial and truck lubrication. A low pressure pump carries a continuous flow of lubricant from the container to a high pressure pump. The latter delivers at the rate of 18 oz. of lubricant per minute, or in the case of extremely fibrous and heavy lubricants the quantity is 6½ oz. A pressure, 33 times the air pressure used, is available to furnish a delivery sufficient to take care of several outlets.

Among the advantages claimed is that the direct flow of lubricant from container to pump without exposure prevents contamination and insures strict cleanliness for the most sanitary plant. Removal of the barrel pump's top cover, held in place with one bolt, gives access to all working parts of the air motor. The check valve may be cleaned without detaching the hose from the gun. A 3 or 4-wheel truck is provided for portability, or if desired, a stationary base.

Circuit Breaker

OIL-BLAST BREAKERS for panel mounting, type SK-43, are announced by the General Electric Co., Schenectady, N. Y. This new type is said to require 35 per cent less floor space because of the oil-blast principle of interruption, which is also said to increase the reliability of operation. Other advantages claimed are reduced maintenance, silver-to-silver current-carrying contacts which prevent cumulative overheating, and a new type of solid butt interrupting contacts which have longer life. These breakers are designed for any type of mounting and can be operated either manually or electrically. Ratings are 600 amp., 600 volts; 1,200 amp., 7,500 volts; with an interrupting rating of 30,000 kv-a. at rated voltage. A complete line of accessories is available.

The Manufacturers Offer . . .

Belt Drive—Group drive by belt for industrial machinery is illustrated and described in a new 36-page booklet published by Mechanical Power Engineering Associates, 370 Lexington Ave., New York, N. Y.

Steam Boilers—Horizontal return tubular boilers suitable for industrial plant use are described by Combustion Engineering Co., 200 Madison Ave., New York, N. Y., in a new bulletin entitled General Specifications HT-10.

Shipping Cartons—A mailing piece recently issued by the Hinde & Dauch Paper Co., Sandusky, Ohio, deals with the use of the paper shipping box as a billboard upon which to carry an advertising message concerning the product contained.

Metallic Zinc Paint—The use of paint containing metallic zinc powder as a primer and finishing coat for iron, steel and galvanized surfaces is discussed in a new bulletin issued by the New Jersey Zinc Sales Co., 160 Front St., New York, N. Y.

Packaging—Vol. 1 No. 1 of a new periodical issued by F. J. Stokes Machine Co., Philadelphia, Pa., deals with machines, methods and economies in filling and packaging products and in processing. The periodical is called "Process News."

Plastics—A new periodical dealing with the various uses of plastics made by Toledo Synthetic Products Co., Toledo, Ohio, is called "Plaskon Parade."

Pyrometer—A folder recently issued by the Brown Instrument Co., Philadelphia, Pa., discusses the industrial uses of potentiometer pyrometers made by this company.

Filling Machines—For filling mayonnaise, mustard, jellies and preserves and similar products, the U. S. Twin Piston Filler is described in Bulletin TPF-1 issued by U. S. Bottlers Machinery Co., 4015 N. Rockwell St., Chicago, Ill.

Wire Cloth—A 4-page illustrated folder of the Newark Wire Cloth Co., 351 Verona Ave., Newark, N. J., gives data on typical weaves and meshes of sieve and filter cloth made by this company.

Plant Equipment — Processing equipment including dryers, evaporators, heat transfer equipment, and distillation equipment is the subject of condensed general catalog 105-B of J. P. Devine Mfg. Co., Inc., Mt. Vernon, Ill.

Brine Making—The "Lixate" process for the manufacture of clear salt brine from rock salt is discussed and illustrated by International Salt Co., Inc., Scranton, Pa., in a recent 16-page booklet.

Shipping Bags — Open mouth, multi-wall paper bags and the equipment for filling and closing them are the subject of a bulletin issued by Bagpak, Inc., 222 East 42d St., New York City.

Pumps and Compressors—Seven new bulletins have been issued by Worthington Pump & Machinery Co., Harrison, N. J., as follows: Type VS air compressor units; Type VA-2, 2-stage vertical angle air compressors; Type U, 2-stage volute centrifugal pumps; Type C, CA and CB centrifugal pumps for belt and motor drive; Type UC, 3-stage volute centrifugal pumps; Monobloc centrifugal pumps; and Type DE, DF and DG Monobloc centrifugal pumps, Nos. 3 and 4.

Packing Equipment—Two leaflets of Cincinnati Butchers Supply Corp., 1972 Central Ave., Cincinnati, Ohio, discuss "Boss" super sheer-cutting plates with solid scimiter super knife, "Boss" cube fat cutter No. 465, "Boss" air stuffer No. 477, and No. 461 cutter with friction unloader.

Motors and Generators—Type E motors and generators for direct current, manufactured by Allis-Chalmers Mfg. Co., Milwaukee, Wis., and wound rotor induction motors, Type ARY, made by the same company, are discussed in leaflets 2183 and 2100.

Truck Handling—The "pallet" system of materials handling as outlined by Elwell Parker Electric Co., Cleveland, Ohio, is discussed in a new booklet entitled "This New Industrial Pick-Up."

Induction Motors—Polyphase motors from 1/6 to 600 hp., made by Century Electric Co., 1806 Pine St., St. Louis, Mo., are described in a new bulletin.

Whole Grain Corn—A. K. Robins & Co., Inc., Baltimore, Md., have recently issued a book on whole grain corn by Ralph Cover, containing a comparative analysis of the whole grain corns of the United States and Canada, and studies of the effects of machines, methods and theories of operation upon the finished product in the cans.

Power Jack—For maintenance workers on automotive equipment and throughout the plant, a new booklet has been issued by Blackhawk Mfg. Co., Milwaukee, Wis., which is entitled "How to Use the Blackhawk Porto-Power Jack."

Flowmeters — Instruments for measuring the flow of steam, liquids and gases, made by the Foxboro Co., Foxboro, Mass., form the subject of Bulletin 200, a new 48-page catalog of this company's line of flowmeters.

Screw Capper — For placing all types of screw caps on bottles, cans and jars, the Whirlwind Universal screw capper, a portable device, is described by Scientific Filter Co., Franklin Square, New York, in a recent folder.

Painting Equipment—Spray guns and accessory equipment for painting and for cleaning and washing are described by Binks Mfg. Co., 3114 Carroll Ave., Chicago, Ill., in Bulletin AB-114.

Laboratory Equipment—The "Blue" line of graduated glass laboratory equipment, made by Kimble Glass Co., Vineland, N. J., is the subject of a 64-page catalog Form No. 199.

Conveyor Idlers — Positive self-aligning idlers for troughed conveyor belts, as made by Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill., are described in Folder No. 1408.

Books Received

A SUMMARY OF FOOD LAWS & REGULATIONS. By C. L. Hinton, British Association of Research for the Cocoa, Chocolate, Sugar Confectionery and Jam Trades. Published by The Nema Press, Ltd., 33 Tothill St., S.W.1, London. 1934. 90 pp. 7½x10 in.; cloth Price 21 shillings (approx. $5).

Although the contents of this book deals primarily with the laws and regulations of the British Isles, comparisons are made with the terms of those of other political divisions of the world. Listed in table form the salient points of these comparisons are given on ten groups of food commodities for as many as 20 different countries. In the United States this compilation is primarily of interest to food processors dealing with foreign markets. Several chapters appeared in the English publication, *Food*.

TINPLATE AND CANNING IN GREAT BRITAIN. Published by the International Tin Research and Development Council, Mansfield House, 378 Strand, London, W.C. 2. (American office 149 Broadway, New York, N. Y.) 1935. 82 pp., 7¼x9¾ in., paper; illustrated. Price, free.

Containing original articles on several phases of canning by authoritative authors this bulletin reports results of an exhaustive survey of progress in canning and tinplate manufacture not only in Great Britain but also takes up some aspects of developments in the United States and other countries. It is the first of a series of bulletins on the use of tin. A similar bulletin dealing with the canning and tinplate industries in the United States is in prospect.

ELECTROKINETIC PHENOMENA. By Harold A. Abramson. Published by The Chemical Catalog, Co., Inc., 330 West 42d St., New York, N. Y. 1934. 331 pp. 6¼x9¼ in.; cloth; illustrated. Price $7.50.

Those of our readers who delve into the rarer atmosphere of science for new technical knowledge which has an industrial importance or seek to find explanations for the phenomena they observe in connection with industrial practices will welcome this contribution to the literature of science. Surface chemistry in connection with food manufacture is getting an increasing amount of attention. Particular study is being made on lecithin and similar phosphatides and their effect upon emulsions, on proteins and their behavior under food processing conditions, and on gases in relation to stabilization of flavor—and aroma—imparting principles in food. American Chemical Society Monograph No. 66.

A PRIMER OF MONEY. By Donald B. Woodward and Marc A. Rose. Published by Whittlesey House, McGraw-Hill Book Co., 330 West 42d St., New York, N. Y. 1935. 322 pp.; 5¾x8¼ in.; cloth; illustrated. Price $2.50.

With all our striving to obtain a greater supply and to make profitable use of it few, if any, of us really understand money. The authors of this primer have attempted to explain the principles of money, credit, and banking in language that all of us can understand. In the confusion which is all about us and the hubbub that the proponents of the various theories of finance have stirred up during the past few years such a layman to layman discussion of these factors is welcome.

The first book having this title and by the same authors was published in 1932. So well did it fill a need that it has been brought up to date and combined with another book, Inflation, to make an enlarged and more complete treatise on money and its use.

PATENTS

Water Treated by Introduction of Measured Flow of Chlorine Gas Into Flowing Water in Mains—John C. Baker and Gerald D. Peet, Montclair, N. J., to Wallace & Tiernan Co., Inc., Belleville, N. J. No. 1,995,914. March 26, 1935.

Carbon Dioxide Content of Egg Meats Maintained at Normal Fresh-Egg Level by Introduction of Carbon Dioxide Gas—Mary E. Pennington and Arthur W. Thomas, to the Borden Co., New York, N. Y. No. 1,996,171. April 2, 1935.

Theine-Free Tea Prepared by Use of Organic Solvent and Solvent Vapors—Theodor Grethe, Hamburg, Germany. No. 1,996,199. April 2, 1935.

Weevils in Grain Exterminated by Heat Treatment in a Series of Perforated Cylindrical Cells Each Fitted With a Spiral Agitator Concentrically Arranged and Alternately Placed to Reverse Direction of Movement of Grain — Roy R. Reppert, Bryan, Texas. No. 1,996,347. April 2, 1935.

Egg Whites Liquefied With an Acid For Drying—Norman C. Fischer to Armour & Co., Chicago, Ill. Nos. 1,996,800 and 1,996,801. April 9, 1935.

Plastic Dairy Foods Pasteurized by Frictional Heat During Emulsification—George C. Alstad and John H. Baumgartner to Doering Research and Development Corp., Chicago, Ill. Nos. 1,997,032; 1,997,033; 1,997,034. April 9, 1935.

Acid Fruit Jellies Stabilized by Use of a Pectin and Calcium and/or Magnesium Carbonate Composition — Leo Wallerstein, Julius Pfannmuller and Alfons Noë to Wallerstein Co., Inc., New York, N. Y. Nos 1,997,615 and 1,997,616. April 16, 1935.

Cheese Made Fluid and Homogenized Preliminary to Drying Into Grated Form—Robert Roy Irvin, Milwaukee, Wis., to Davis Cheese Co. No. 1,997,866. April 16, 1935.

Eggs Cracked Mechanically and Freed From Meats by Jets of Compressed Air—Frank Drexel, San Francisco, Calif. No. 1,997,881. April 16, 1935.

Milk Bottles Closed With a Top Lock—Benjamin P. Youmans, Vancouver, Wash. No. 1,997,895. April 16, 1935.

Butter Produced in a Continuous Churn-Unit—Charles Doering, Chicago, Ill. No. 1,997,999. April 16, 1935.

Soft Curd Milk Made by Chilling Whole Milk to Less than 15 Deg. C., But Above the Freezing Point of Milk and Subjecting it to Vigorous Agitation—Erik Lundstedt to Pfister Chemical Co., Inc., Richfield, N. J. No. 1,998,141. April 16, 1935.

Synthetic Coconut Water and Essence of Coconut Prepared From Coconut Oil—Eliseo Luque, Ponce, Puerto Rico, to Luque & Fuertes, San Juan, P.R. No. 1,998,375. April 16, 1935.

Foods Quick-Frozen in Refrigerating Machine Comprising of Means for Refrigerating Heat-Conductive Plates and Plurality of Molds Movable Between the Plates—Clarence Birdseye, Gloucester, Mass., to Frosted Foods Co., Inc., Dover, Del. No. 1,998,431. April 23, 1935.

Cream Freed From Curd, Sediment and Other Solids by Passage Through Screening Device While in a Heated State—Cecil E. Harrow, Kansas City, Mo. No. 1,998,622. April 23, 1935.

Fats and Oils Freed of Fatty Acids by Heating to 600 Deg. F. and Introducing Into Distilling Zone Under Reduced Pressure With or Without the Introduction of Steam—Lucius M. Tolman to New Process Fat Refining Corp., Chicago, Ill. Nos. 1,998,997 and 1,998,998. April 23, 1935.

Cream Ripened in Vat Fitted With a Hollowed Stirrer Through Which a Heat Exchanging Medium Passes—Anton Bröer, Hamburg, Germany, to Schwelmer Eisenwerk Muller & Co., Aktiengesellschaft, Schwelm, Westphalia, Germany. No. 1,999,081. April 23, 1935.

Fruit Juices Freed From Natural Occuring Pectin by Treatment With Pectinase Preliminary to Use for Jelly-Making With a Standardized Pectin Content—Raymond Edward Cox, Corona, Calif., to California Fruit Growers Exchange, Los Angeles, Calif. No. 1,999,443. April 30, 1935.

Tray Bake Oven With a Preheating and Finishing Compartment at Front End With a Direct Heating And Baking Chamber in Bottom And Back of Oven — Louis D. Houlis, Dallas, Tex. No. 1,999,503. April 30, 1935.

Pitless Prunes Dried by Removal of Moisture Through Opening Formed to Remove Pits—Albert H. Boyd, Newberg, Oregon. No. 1,999,533. April 30, 1935.

Stable Highly Concentrated Malt Syrup From Short Germinated, High-Temperature Dried Malt Which is Mashed at About 70 Deg. C. to Avoid Excess Proteolysis; Wort Concentrated to About 80 per cent Solids—Herbert C. Gore, Stephen Józa, and Charles N. Frey to Standard Brands, Inc., Dover, Del. No. 2,000,169. May 7, 1935.

Field-Run Corn Cut and Graded Suitable for Processing and Canning as The Different Commercial Grades or Styles of Green Corn—Harold R. Lewis, Hoopeston, Ill. No. 2,000,892. May 7, 1935.

Ice Cream and Fruit Ices Molded Into Cone Shape by Solidifying in the Edible Cone—Rudolph G. Thoke, La Grange, Ill., to Hydrox Corp., Chicago, Ill. No. 2,001,371. May 14, 1935.

Ice Cream in Cylindrically Shaped Individual Consumer Portions Wrapped and Packed in Paper Containers Specially Designed for Convenience in Both Shipping and Serving—Clarence W. Vogt, to Vogt Processes, Inc., Louisville, Ky. Nos. 2,001,475; 2,001,476; 2,001,477, and 2,001,478. May 14, 1935.

Liquid Milk Irradiated by Passage Over Inclined or Vertical Surface With Baffles to Disperse Air or Gas Bubbles and Hold Back Foam Until Milk Has Flowed over the Irradiation Surfaces—Henning A. Trebler, Baltimore, Md., to Hanovia Chemical & Manufacturing Co., Newark, N. J. No. 2,001,555. May 14, 1935.

Beer Wort Aerated in a Roomlike Compartment Having a Cooling Floor to Expose Large Surfaces of the Wort to Filtered Air—Karl Barth and Karl Schuler, Munich, and Julius Wanger, Aubing, Germany. No. 2,001,564. May 14, 1935.

Eggs in Shell Stored in Atmospheric-Oxygen-Free Gas After Vacuum Treatment to Remove Air Content—Fernand Nierinck, Riverside, Chelmsford, England, to Chelmsford Egg Supply Company, Ltd., London, England. No. 2,001,628. May 14, 1935.

BUSINESS TRENDS

Record Tomato Crop Expected

WITH about 7 per cent more acreage devoted this year by representative canners to tomatoes, the Department of Agriculture is looking for a record output. Plans indicate 455,670 acres of tomatoes for canning, compared to 425,470 acres last year. This is the highest planting recorded.

Under average conditions, such an acreage is expected to yield about 1,800,000 tons of tomatoes, compared to a crop of 1,400,000 tons in 1934; 1,100,000 tons in 1933; 1,200,000 tons in 1932; 1,000,000 tons in 1931, 1,750,000 tons in 1930; and 1,550,000 tons in 1929.

Latest advices from various growing districts indicate that this prospect is likely to be realized. Cool weather and rains delay the planting somewhat; but otherwise conditions have been generally favorable, except in Utah, where cold weather and insects have damaged the plants.

Dairy Output Low

PRODUCTION of dairy products continues at low levels, with output of principal manufactured products until recently about 11 per cent below 1934. Along with this has gone a milk production about 2 per cent below last year, with cow population on dairy farms 5 per cent lower than last year.

However, pasturage is now considerably better than it was a year ago. Recent rains have improved conditions greatly, and the present prospect is for a better milk yield throughout the remainder of the year. There should also be some increase in the number of dairy cows, above the drought-influenced number available at the beginning of the year.

One factor that is worth some attention is that the production of milk did not reach as low levels as did the production and consumption of manufactured dairy products. While this may be only a temporary trend, bound up with the price situation and low consumer buying power, it may, on the other hand, indicate a shift in consumer taste. That important factors in the dairy field are aware of the implications of these figures is indicated by the extensive efforts now under way to influence consumers to use more cheese, ice cream and other dairy products.

Fish Advances

ALTHOUGH cold storage holdings of fish have decreased to below the five year average, the quantity held is still above 1934 levels. Fish landings continue in good quantity and the ample supply is moving satisfactorily, except that wholesale prices remain too low.

That the fishing industry is attaining new records is indicated by recent reports of the Bureau of Fisheries. Figures recently issued for the 1934 production of fresh and frozen packaged fish show that output increased to 73,647,000 lb., 13 per cent above the preceding year.

Canned fishery products and by-products increased even more in 1934, registering a gain of 30 per cent over 1933 and 80 per cent over 1932, according to the same source.

Prices Still Fluctuate

COMMODITY PRICES continue to fluctuate between higher and lower levels and thus indicate what is taking place in the field of general business activity.

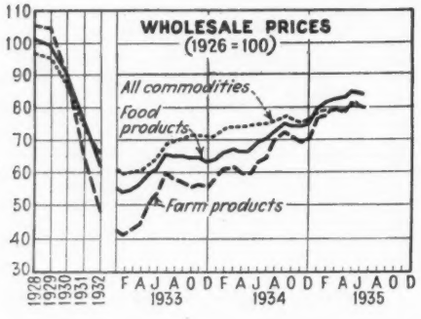
The Supreme Court's death blow to NRA caused a flurry of price cutting and wage reduction only in a few scattered instances but to our knowledge not at all in food manufacturing industries. Continued wet weather in the corn and soft wheat belt is checkmated for its effect upon grain prices by favorable weather for good crops in the spring drouth and dust storm areas; as harvest time approaches grain prices go into a nose dive. The Administration tax program and social legislation are of too recent announcement to have any effect upon business conditions except as they have been anticipated as the logical result of heavy government spending and need for social relief.

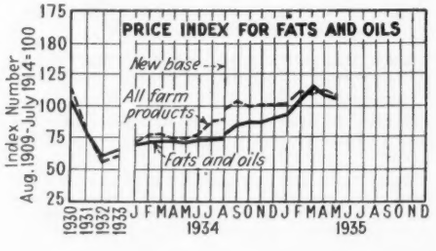
Although the *Business Week* index of business conditions shows a slight advance to 64.3 per cent of normal, a gain of 0.78 per cent, for the four weeks ending June 15 the mid-month course was as definitely downward as it is now upward.

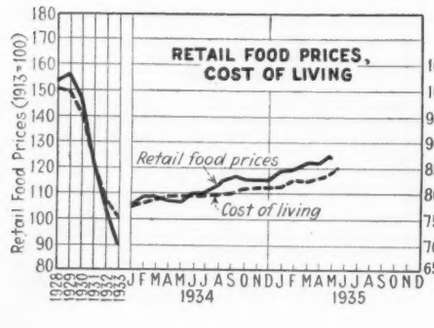
U.S. Department of Labor reports wholesale prices as of June 15 to be 0.25 per cent lower for all commodities; farm products 1.24 per cent and foods 0.48 per cent respectively lower for the month.

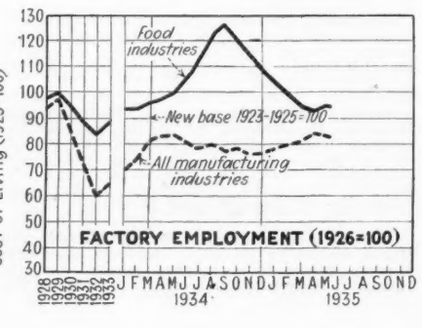
According to the New York *Journal of Commerce* index of weighted prices the general index for the five weeks ending June 22 has declined 3.13 per cent; grain 8.98 per cent and food 8.53 per cent.

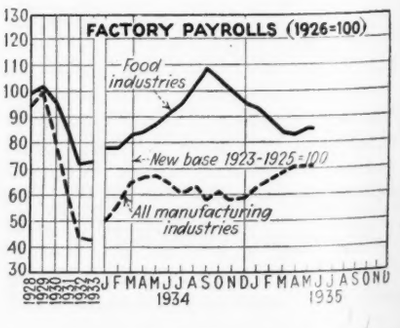
Here again the end-of-month indication is not the whole story. Mid-month reports showed these commodity price indexes on the upward grade. Probably the most interesting feature of this hide-and-seek movement of commodity prices is the seemingly contradictory movement of general business activity index during the same period of time. To critical observers it has been apparent for some time that, as commodity prices fall, general business activity increases and vice versa. To us this result of opposing factors indicates a strong undercurrent of price stabilization at levels within reach of the prospective buyer's pocketbook.






RETAIL FOOD PRICES, COST OF LIVING
Retail Food Prices (1913=100)
Cost of Living (1923=100)
Retail food prices
Cost of living
1928 1929 1930 1931 1932 1933 1934 1935





Pea Prospects Excellent

ALONG with the planting of about 15 per cent greater acreage to canning peas this season than last, improved growing conditions are giving a better than average yield. Early in June, the condition of this crop was reported as 90.4 per cent of normal, compared to a ten-year average of 83.4 per cent, and 60.7 per cent last year.

Prospects in the Del-Mar-Va district are for a pack considerably above 1934, with vines in good condition and little trouble from pests, although the weather has reduced expectations somewhat below the level of June 1. Ohio is experiencing some trouble from pests, while Wisconsin weather has been somewhat colder than desirable. However, a high yield is still in prospect, as indicated by Indiana returns running at 115 cases per acre, and Maryland over 100 cases. In Indiana, a tract of 8,000 acres will produce between 800,000 and 1,000,000 cases.

Cold Storage Holdings Low

JUNE figures of principal foods in cold storage, as reported by the Bureau of Agricultural Economics, still show a majority of products in quantity below normal and below a year ago.

The most serious shortage apparently is in meat, with only 628 million lb. in storage, against a five-year average for the date of 835 million. Beef in storage is almost 50 per cent over the average, the shortage being almost entirely in pork. Poultry in storage is about 12 per cent above the five-year mark.

Egg storage is somewhat below normal, but stored butter has increased rapidly in the last two months and is now less than 10 per cent below the five-year average of 35 million lb. Apples and pears are considerably below the usual figures.

California Crop Outlook

PROSPECTS for fruit and nut yields in California are varied, with high records threatening in some cases, and only small returns promised in others.

Peach yield at 273,000 tons is expected to be the smallest since 1929, and pears at 182,000 tons the smallest since 1927. Plums also will be scarce, with the forecast of 42,000 tons being the lowest since 1929. Almond yield prospects are poor.

On the other hand, a forecast of 214,000 tons of prunes indicates the best return since 1930, and walnuts should give a record yield, estimated at 47,000 tons. Apricots, raisins, figs and apples are also expected in greater quantities than in 1934.

Butter Imports Cease

AS FORECAST in these pages several months ago, butter imports continued into June, and then ceased, as the spread between the New York and London prices narrowed to 10 cents, which is 4 cents less than the tariff on butter imports. Imports tapered down to 100 casks on June 19, the last receipts from abroad here noted. By that time more than 20,000,000 lb. of butter had come in since January.

This cessation of butter imports corresponded with a return to liberal current supplies in the U.S., and an approach to normal in the amount of butter held in cold storage. Before this happened, however, the import movement already noted had been supplemented by an increase in the production and sale of margarine, which in the first five months of the year was at levels about 100 per cent above those of the past five years. One trend that may be significant concerning these oleo sales is that they have tended to increase more than the production of butter fell off.

INDICATORS

BUILDING is increasing, with all building up 34 per cent and residential building up 108 per cent over last year. New York is again commencing to tear down good buildings to replace them with others, always a sign of renewing prosperity.

WHOLESALE FOOD prices continued downward, according to Dun & Bradstreets weekly index, which, on June 18, at $2.58 was low for the year, but 17.8 per cent above the corresponding week of 1934.

RETAIL food prices have advanced in most cities, along with a general increase in the cost of living, as reported by the U.S. Department of Labor.

CARLOADINGS continue to increase and in mid-June were the highest since the 1933 high point, and about 7 per cent above the same week of 1934.

WHEAT CROP forecast by the Department of Agriculture in June was 670,000,000 bushels, compared to 496,000,000 bushels last year.

BEAN STOCKS in California warehouses, at 848,582 bags on June 1, were about 23 per cent below 1934, and nearly at the five-year average figure.

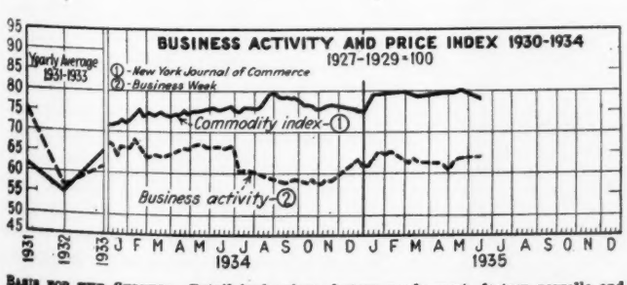
SPICE CONSUMPTION is increasing, according to figures released by the spice industry, which shows upward trends for black pepper and other products, reversing the tendency of the previous decade.

CORPORATE FARMING may increase, as the Department of Agriculture's figures show an increase of 412 per cent in acreage held by corporations, with 1930 taken as a base.

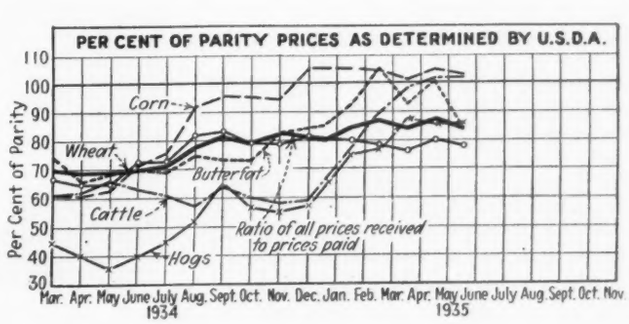
LIVESTOCK prices declined in June, in spite of continued low receipts. Lowered consumer demand for meat products accounts for the decline.

Construction News

	Pending (thousands)	Awarded June (thousands)	Total Awarded 1935 (thousands)
Bakery	$190	$50	$185
Beverages	668	28	2,470
Canning and Preserving	126	....	643
Confectionery	....	....	28
Grain Mill Products	313	189	717
Ice, Manufactured	60	....	234
Meats and Meat Products	28	1,360	1,688
Milk Products	285	215	1,044
Miscellaneous	168	253	1,513
Total	$1,838	$2,095	$8,522



BASIS FOR THE CURVES: Retail food prices, factory employment, factory payrolls and wholesale prices based on indexes of the Department of Labor. Cost of living index is that of the National Industrial Conference Board. Indexes of prices of fats and oils, and of all farm prices are from the U. S. Department of Agriculture, as are the per cent of parity prices.


PER CENT OF PARITY PRICES AS DETERMINED BY U.S.D.A.
Per Cent of Parity
Corn
Wheat
Butterfat
Cattle
Hogs
Ratio of all prices received to prices paid
Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov.
1934
1935

In the Current of Events

- *California legislates danger out of cream filling*
- *Industries survey post-NRA scene at conventions*
- *AAA amendments altered; Food bill held up in House*
- *Food manufacturers will not scrap gains under NRA*
- *Several more packers take processing tax to court*

Makes Cream Filling Safe

To PROTECT the public against food poisoning from contaminated custard cream fillings in éclairs, cream puffs and the like, California State Board of Health issued a set of special regulations on April 20, 1935, about one week before the Westchester County, New York, outbreak took place (see FOOD INDUSTRIES, June, 1935).

These California regulations prescribe not only conditions of production, but also conditions of storage and distribution:

"1. All commercially prepared custards or cream fillings, of pastries shall be made under conditions of cleanliness, involving all stages of manufacture.

"2. Only efficiently pasteurized milk may be used.

"3. The temperature and time of heating the mix shall be as a minimum, the equivalent of a temperature of 140 degrees F., for a period of one hour; provided, however, that other temperatures and times may be used when specifically approved by the Director of Public Health.

"4. Upon completion of the cooking of the custard, it shall immediately be transferred into previously sterilized containers, properly covered, and chilled without delay to 50 deg. F.

"5. Custards must be kept in the cooling room until used in making pastries.

"6. The filling apparatus, which shall be wholly of metal, shall be cleaned with hot water and sterilized brushes or with a jet of live steam under pressure. No cloth filling bags may be used.

"7. Before use, filling apparatus shall be sterilized by either boiling for ten minutes, or steaming in a steam sterilizer for one hour.

"8. No pastries containing cream filling shall be displayed in windows or showcases, except those that are chilled to a maximum of 50 deg. F.

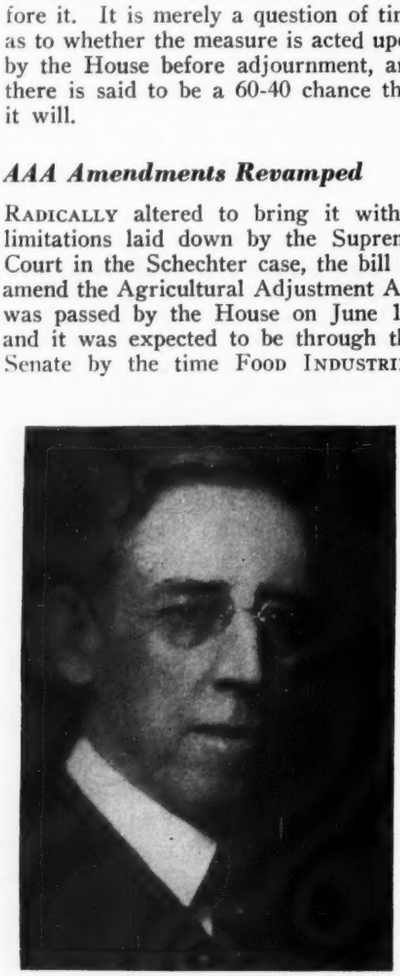
"9. Pastries containing custard cream filling shall not be sold from wagons, from door to door, except such wagons be equipped with a refrigerated compartment maintaining a maximum temperature of 50 deg. F.; provided, however, that pastries may be delivered from manufacturers to retail dealers or consumers by special trip with no stop between without continuous refrigeration when it is possible to complete such delivery within two hours elapsed time."

Food Bill Delayed

PASSED by the Senate on May 28, the amended Copeland Bill had progressed no farther toward enactment at the end of June. Washington observers were of the opinion that the bill would pass the House if it ever got before it, but it was being held up in the House Interstate Commerce Committee through indifference on the part of the committee and because of the mass of work before it. It is merely a question of time as to whether the measure is acted upon by the House before adjournment, and there is said to be a 60-40 chance that it will.

AAA Amendments Revamped

RADICALLY altered to bring it within limitations laid down by the Supreme Court in the Schechter case, the bill to amend the Agricultural Adjustment Act was passed by the House on June 18, and it was expected to be through the Senate by the time FOOD INDUSTRIES was off the press. Known in the House as H.R. 8492, the bill contains fourteen amendments and combines most of the farm-relief proposals of the last ten years, even to a $100,000,000 fund for carrying out a modified version of the old McNary-Haugen plan.



W. E. BROCK
New president of N.C.A.

The amendments prescribe definite procedure for the removal of surpluses and stimulation of exports. They substitute for the existing licensing system authority for the Secretary of Agriculture to issue orders, with Presidential approval, establishing minimum wages, quota allotments and terms of sale with respect to milk, vegetables, fruits, walnuts and pecans; canned fruits and vegetables are excluded. If 50 per cent of the producers and processors are in agreement, approval of the President is not needed.

The amendments also stipulate that no one may sue for the recovery of processing taxes; redefine interstate commerce provisions of the present law; permit rental and benefit payments to increase, as well as decrease, farm output; and give existing processing taxes a legal status. The bill not only gives the Secretary access to the books of parties to agreements, but permits him to have a look at their income-tax returns. An amendment to the bill prohibits inclusion in agreements of anything interfering with the marketing of dairy products in an area other than where they were produced.

Under the terms of the bill, apples are declared not to be fruits and soy beans are defined as vegetables.

Confectioners Lead Way

WRECKING of the NRA code-enforcement setup on the eve of the 52nd annual convention of National Confectioners' Association, held in Chicago, June 4-7, placed leaders of that industry in the limelight. From their action on wages and hours, fair trade practices and price maintenance, one could get a reasonable index as to what would likely be the course of the food-manufacturing industries.

Retiring president George H. Williamson reminded those in attendance at the opening meeting that the industry's experience with the candy manufacturers' code

had been unsatisfactory but that the members of the industry had gained an experience which could be used to help themselves; that a government enforced code was not needed to get the industry out of its difficulties.

Resolutions were adopted to maintain voluntarily the code level of wages and hours, to abolish child labor and to identify the industry products as being produced in accordance with provisions of the candy manufacturers' code.

Otherwise, the convention proceeded according to the original program. Management and production subjects came in for particular attention. Stanley Kedzierski, Department of Commerce, gave an extensive treatise on costs and cost finding; F. A. Buese, E. J. Brach & Sons, Chicago, led a discussion on control of labor costs; Walter H. Belcher, formerly of Walter M. Lowney Co., emphasized the importance of a definite and understood labor-relation policy; and Arthur M. Kessler, plant manager, Robert A. Johnston Co., Milwaukee, stressed the point that a candy factory is a machine for the production of confectionery products and as such should be designed and equipped to the end of producing the desired volume and quality at the lowest cost

Other speakers touched upon management. R. D. Reeds, E. J. Brach & Sons, talked on the prospective rise in freight rates as a result of Coordinator Eastman's efforts in behalf of the railroads; Max F. Burger, managing director of N.C.A., on products liability and the advisability of joining in on group liability insurance; and Stroud Jordan, Stroud Jordan Laboratories, New York, on new food legislation and the importance to the confectionery industry of adopting standards and definitions for its products and of taking steps to counteract the effect of misleading propaganda against food products in general and confectionery in particular. Committee reports were made on taxes, new legislation, and trademark registration and protection.

Under the Chairmanship of Wm. A. Melody, production manager, E. J. Brach & Sons, a production forum discussed accident prevention, sanitation, detection of foreign substances in finished products and elimination of the possibility of heavy metal contamination due to soldered repairs, joints or seams.

One of the high points in the convention was the report of Stevenson, Jordan and Harrison, New York, who in March had been employed as confidential agent of the code authority to study conditions in the confectionery industry and to formulate a plan under which the industry could organize and operate its merchandising programs. C. H. Ferris of this company presented a plan based on the type of confections produced by the various manufacturers. These commodity groups were further classified by geographical marketing areas. In each area would be a local organization to deal with the local problems and to gather statistical information which could be used as a basis of preventing an oversupply and destructive price cutting. No final action was taken on the report, although it was recommended for further consideration by the association officers.

WASHINGTON PLATT
Heads cereal chemists' group.

Merchandising was not overlooked. Marston Abercrombie, sales manager, Henry Heide, Inc., New York, gave one of the most interest-arousing talks of the convention, on selling candy. He emphasized the need for recognition of three phases of candy selling: 1. Machinery of distribution identifying and differentiating between "wholesale confectioner" and "candy jobber"; 2. sales methods; 3. increasing consumer demand.

F. H. Rawls, chief of the Foodstuffs Division of the Department of Commerce, gave a survey of market conditions in the confectionery field during the past year. He reported that 343 manufacturers had 11 per cent greater poundage sales in 1934 than in 1933 and that dollar sales were up 15 per cent. Whereas total retail food dollar sales had increased only approximately 7 per cent.

The exposition was the best since 1930. There were 75 exhibitors, 21 being there for the first time. Several reported sales and orders booked on Monday afternoon before the convention officially opened. Machinery sales were particularly good, especially in caramel and other wrapped-candy lines. Not only was the number of exhibitors 30 per cent greater than in 1934; the registered attendance was reported as being about 50 per cent larger.

The confectioners selected as their new president W. E. Brock, Brock Candy Co., Chattanooga, Tenn. H. R. Chapman, New England Confectionery Co., Cambridge, Mass., was made a vice-president, as was C. H. Woodward, John G. Woodward & Co., Council Bluffs, Iowa.

Cereal Chemists in Denver

To REPORT results obtained through individual and committee efforts towards the solution of problems confronting users of cereal products, members of American Association of Cereal Chemists congregated in their 21st annual meeting, which was held June 4-8, at Denver.

An overcrowded program resulted in two sessions being held concurrently on Friday morning, June 7. One of the sessions was devoted to malting subjects, a new phase of cereal-chemist activity resulting from legalization of alcoholic beverages which are made from malt.

During the meeting, the mornings were devoted to a scheduled program and the afternoons left free for committee meetings, executive sessions, plant inspection trips and informal meetings or group discussions. In all, approximately 60 papers and committee reports were read before the five morning sessions. These papers ranged from work done on wheat and flour to that done on cake, bread, pies, crackers and biscuits, yeast, barley, malting, durum wheat products and standardization of laboratory methods and experimental baking tests.

In spite of the distances traveled to reach Denver, of floods, and of general economic conditions, 140 registrants, plus 60 wives, were in attendance. Departing from the previous custom of selecting the next meeting place after the first of the year, Dallas was chosen during this year's meeting as the meeting place for 1936. The first week in June will likely be the time.

Another departure from previous custom is the division of the secretary-treasurer duties between two separate offices. This move was made necessary by the growth of the association and the widening of its activities.

Officers for the coming year are: President, Washington Platt, Borden Co., Syracuse, N. Y.; vice-president, Harry D. Liggit, Jr., chief chemist, Colorado Milling and Elevator Co., Denver; treasurer, M. D. Mize, Omaha (Neb.) Grain Exchange; secretary, H. W. Putnam, Hays City Flour Mills, Hays, Kan.

D. A. Coleman, Department of Agriculture, was reelected editor-in-chief of *Cereal Chemisty*, and C. C. Fifield, Department of Agriculture, was renamed managing editor of the cereal chemists' publication.

To M. J. Blish, Agricultural Experiment Station, Lincoln, Neb., was awarded the Osborne Medal in recognition for his work on the proteins of flour.

Packers Sue AAA

More meat packers have gone out after the scalp of AAA in what amounts to a concerted drive on the part of the industry to get rid of the pork processing tax. Six companies filed separate suits in the Federal District Court at Philadelphia, attacking the constitutionality of the AAA and seeking to restrain the collection of unpaid processing taxes. And four other companies in Louisville, Birmingham, Indianapolis and Fort Dodge, Iowa, have taken similar action, this in addition to suits already in the courts.

The packers argue that the government has no power to control production, that the processing tax is not in reality a tax, as defined in the Constitution, and that the Secretary of Agriculture should not be delegated arbitrary taxing powers. They contend that the emergency responsible for the tax has passed, the price of pork being in excess of the average for the base period, August, 1909, to July, 1914, as defined in the A.A. Act. The packers say they are losing money, and that the tax cannot be passed on to the consumers.

The Pennsylvania packers trying to break the AAA include John J. Felin & Co., F. G. Vogt & Son, A. C. Roberts, Chester Packing and Provision Co., Weiland Packing Co., and Jacob Ulmer Packing Co. The Louisville plaintiff is Louisville Provision Co.; the one in Birmingham, Alabama Packing Co.; in Indianapolis, Kingan & Co.; and in Fort Dodge, Tobin Packing Co.

NRA Not Needed

Judging from present plans of food-trade associations and of individual companies, the death of NRA will be no cause for mourning. For the food field not only is maintaining wages and hours established under the Recovery Act, but for the most part is endeavoring to continue the worth-while fair-trade practices sponsored by the Blue Eagle.

Soon after the famous Supreme Court decision, Associated Grocery Manufacturers of America, which is representative of several food industries, adopted a resolution recommending continuance of code labor requirements. The association also called a conference to decide what should be done toward preserving the NRA's improvements in inter-trade relations.

Meeting early in June, the code authority of the brewing industry advised the brewers to continue under a voluntary code, if possible, and it called a mass meeting of brewers to discuss future policies. New York State brewers acted even more quickly than the national code body, adopting a voluntary code of fair competition similar to that existing under NRA, vesting enforcement in New York State Brewers' Association.

Immediately after the demise of NRA, Canners League of California requested all canners to observe NRA wages and hours. Wine Institute, representing 80 per cent of the American wine industry, recommended that members of the industry maintain wages and hours and continue present practices of labeling and selling. The wine industry expects the Federal Alcohol Control Administration to be reorganized and the fair trade practices and wine quality regulations provided thereunder to be preserved.

"We see no immediate reason for readjustment of hours or wages," replied California Fruit Growers' Exchange to an inquiry by Food Industries. "It is our opinion that after the subsiding of the disturbance which inevitably followed the Supreme Court's decision, no damage to the food manufacturing industry will be found to exist. We believe that the decision should clear the atmosphere and in the end contribute to recovery."

Members of the Cherry & Glacé Fruit Association have reorganized to carry out activities provided for in the industry's code, adopting a new constitution and bylaws. New England Bakers' Association, at its annual meeting, decided to create a sort of voluntary control to retain the benefits of their code as to fair trade practices.

Members of Association of New York State Canners have voted unanimously to continue the minimum wage scale of the canning code. At a meeting of New York State flour millers, continuation of present hours and wages was urged, and the millers also approved the principles of a package differential, carrying charges, reasonable limitation of all contracts, collection of carrying charges on all existing contracts and a reporting system to be supported by mills participating in such a service.

Several large food manufacturers have publicly expressed their intentions to maintain NRA hours and wages, and a great many others intend to follow this procedure. Here are some which do not intend to scrap the labor regulations of NRA: General Foods Corp., New York; Armour & Co., Chicago; California Packing Corp., San Francisco; General Mills, Inc., Minneapolis; Kellogg Co., Battle Creek, Mich.; H. J. Heinz Co., Pittsburgh; Kroger Grocery & Baking Co., Cincinnati; and William Wrigley, Jr., Co., Chicago.

W. F. MEYER
Re-elected president of F.E.M.A.

Sweden Lowers Tariffs

Again the food industries profit by a reciprocal trade agreement negotiated by the United States, this time with Sweden. The agreement, to take effect 30 days after approval and ratification, lowers the Swedish duty on a number of foods. These are the concessions:

	Old rate Swedish crowns	New rate per 100 kilos
Salmon, salted	20.00	Free
Salmon, sweet-salted	20.00	Free
Raisins	15.00	Free
Baking powder	40.00	30.00
Cereal breakfast foods	20.00	15.00
Canned fruits — peaches, apricots, pears, mixed fruits	75.00	50.00
Pineapples, grapefruit	75.00	30.00
Canned soups	75.00	50.00
Canned pork and beans	75.00	50.00

The treaty also provides that during its three-year term the present duties will continue on salted pork, milled rice, dried fruits, cornstarch and cottonseed cake.

Flavoring Industry Meets

Addressing the 26th annual convention of the Flavoring Extract Manufacturers' Association on its opening day, June 3, in Chicago, W. F. Meyer, president, declared "We can all be thankful that the worst years covering this period of depression are passed. I really believe that we are on the upgrade, and that conditions will get better in spite of what Washington does or does not do. The majority of industrialists whom I have talked to tell me that 1934 was a good year."

At this convention, the principal business was the formulation of policies for self-policing the flavoring-extract industry to insure adherence to fair trade practices established by the defunct NRA codes, and a thorough discussion of the Federal Food, Drugs and Cosmetic Bill. John S. Hall, executive secretary, stated the association is favorable in general to the food bill, especially the sections pertaining to adulteration and misbranding.

F. M. Henley, U. S. Medicinal Alcohol Sales Co., warned of increasing alcohol prices in the near future, stating that raw materials have been advancing steadily since last April. The production of synthetic industrial alcohol has reached some degree of commercial importance, he stated, and may influence future consumption.

The following officers were re-elected: W. E. Meyer, Warner-Jenkinson Co., St. Louis, president; George M Armor, McCormick & Co., Baltimore, Clark C. Nowland, Geo. H. Nowland Co., Cincinnati, and William J. Sunn, Baker Extract Co., Springfield, Mass., vice-presidents; E. L. Brendlinger, Dill Co., Norristown, Pa., secretary; and Frank L. Beggs, Styron-Beggs Co., Newark, Ohio, treasurer.

Macaroni Plans

THE skeletonized organization of National Macaroni Manufacturers Association, which was all but abandoned when the macaroni code was approved almost two years ago, was revived at a convention in Brooklyn, N. Y., June 17-19.

What to do next, was the outstanding problem, and despite three days of discussion, a final plan was not adopted, but left to the board of directors to formulate. The constitution and by-laws were restored to status quo ante NRA and amended to permit continuing the deliberations and balloting by mail.

Contrary to the experience of many food industries, the macaroni crowd liked their code and hated to see it removed. The industry is considering organizing in regional economic areas under the national association with voluntary agreements as to wages, hours, product standards and such items as may be legal. There is also a proposal to engage a paid, full-time executive to head the organization.

The plan to go in for a public educational campaign was deferred pending decision on how the industry is to be organized and how funds may be made available.

Head Millers Meet

WITH customary emphasis on flour-production and mill-operation problems, members of Association of Operative Millers met June 3-6, at St. Louis, in their 40th annual convention. Ending the convention with the banquet on the third evening was an experiment approved by the 400 registrants which may be tried again next year.

Technical aspects of milling were discussed in "The Hardness of Grain," by R. O. Pence, department of milling, K.S.A.C., Manhattan, Kan.; "Developments in Wheat Cleaning," by Paul K. Fisher, Commercial Milling Co., Detroit; and "Conditioning," by C. W. Brabender, Duisberg, Germany.

Mill operation and maintenance subjects dealt with were: "Mechanical Transmission Drives in Flour Mills," by Victor Hanson, chief research engineer, Power Transmission Council, New York; "Flour Mill Lubrication," by C. M. Park, engineer, Mutual Fire Protection Bureau, Chicago; and, in the open forum, "Problems of the Soft Wheat Miller," "Equipment Problems," "Tempering" and "Methods of 'Mixing' and 'Spreading' the Tempering Water."

Of more general nature were papers by Carl F. Dietz, ex-code director, on "Observations on the Millers' Code"; by George S. O. Smith, superintendent, Higginsville (Mo.) Flour Mills, on "Education for the Miller"; and by Hylton R. Brown, Department of Agriculture, on "Dust Explosions."

WILLIAM A. HEFLER
With White House Bakeries, Inc., Boston, he again has been chosen to head up New England Bakers' Association.

Housewives Aroused

ALREADY beset with troubles brought about by a shortage of livestock, meat packers distributing in New York and Chicago have had consumers' strikes on their hands for the past few weeks. Started in New York, where militant housewives paraded the streets with "don't buy meat" posters, the idea gained support, but little action, in Chicago in the middle of June. And on June 20, delegations of housewives from the two cities stormed Washington to demand a Congressional investigation of alleged monopolistic food prices.

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Conventions

JULY

9-11—National Confectionery Salesmen's Association of America, Statler Hotel, Buffalo. Henry H. Michaels, 282 Northern Ave., New York, secretary.
10—National Kraut Packers Association.

AUGUST

15-18—National Food Distributors Association, annual meeting, Hotel Statler, Detroit. E. J. Martin, 110 N. Franklin St., Chicago, secretary.
19-23—American Chemical Society, semi-annual meeting, San Francisco. Charles L. Parsons, 728 Mills Bldg., Washington, D. C., secretary.
29—American Cranberry Growers Association, semi-annual meeting, Pemberton, N. J. Charles S. Beckwith, Pemberton, secretary.

Pasteurization Permitted

PERMISSIVE pasteurization has been voted into the official methods and standards for the production of certified milk. This was the outstanding action taken at the joint annual convention of American Association of Medical Milk Commissions and Certified Milk Producers' Association of America, held at Atlantic City, N. J., June 10-11. Those attending the conference hailed the step as one of the most forward-looking developments in the history of certified milk. They pointed out that it not only will add to the safety of this already sanitary food, but will greatly increase its sales potentialities.

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Concentrates

INDUSTRIAL loans totaling $3,503,950 had been made to food industries up to April 1 by the RFC as follows: dairy products, $613,000; meat and poultry packing, $409,000; canning and preserving, $380,100; flour milling, bread and bakery products, $641,800; all others, $1,460,050.

THE WISCONSIN bill compelling hotels and restaurants to serve two-thirds of an ounce of butter and a like quantity of cheese with every 25-cent meal has been signed by the governor . . . A. H. Lauterbach has quit as chief of the dairy section of AAA to manage Inter-State Milk Producers' Association, Philadelphia, and is succeeded by Edwin W. Gaumnitz, his assistant . . . A new marketing agreement and license for the evaporated-milk industry became effective June 1.

CHARGES of domination of the Chicago poultry business by organized rackets have been made by Security Produce Co., Inc. . . . The Food & Drug Administration recently seized several shipments of macaroni, spaghetti and noodles containing added yellow color, soy-bean flour being one of the coloring ingredients . . . A survey by Modern Science Institute reveals that 43 chefs prefer imported wines as compared with 36 favoring domestic and 13 without preference. Flavor was the outstanding reason for favoring imported wines; low cost, domestic.

NATIONAL CONFECTIONERS' ASSOCIATION has arranged for group insurance on products liability claims, the rate being 3 cents per hundred, full coverage . . . Rates on canned pineapple and sugar from Hawaii to the Pacific Coast and Atlantic ports were increased 50 cents a ton, June 1 . . . Seventy eight pineapple canneries in Taiwan have merged as Tiawan Hori Godo Kaisha.

Men . . . Jobs . . . and Companies

Industry

• ARCADIA FARMS, INC., is constructing a new plant at Curtice, Ohio, to manufacture ketchup, chili sauce and tomato juice.

• ARMOUR & Co. has been negotiating for acquisition of control of Adolph Gobel, Inc. The company may lease the Decker plant at Mason City, Iowa, instead of purchasing it.

• BANNER BRANDS CO., INC., Brooklyn, N. Y., has reorganized, enlarging both its staff and manufacturing facilities.

• BORDEN MILK CO. has opened a new cooling plant of 15,000 lb. daily capacity at Mexia, Texas.

• CEDARBURG CANNERIES, INC., is building a $100,000 factory at Milwaukee.

• COLONIAL GRAPE PRODUCTS CO., San Francisco, has set up wine centers with a capacity of 1,100,000 gal.

• COX BAKING CO., INC., Jamaica, N. Y., recently sold its assets, good will and trademarks to Grennan Bakeries, Inc., New York, a subsidiary of Purity Bakeries. The company will be known as the Cox baking division of Grennan Bakeries.

• CUDAHY PACKING CO. plans to refinance two outstanding bond issues amounting to $17,000,000.

• DUNDEE (Ore.) DRYING CORP. has been taken over by Hudson-Duncan & Co., Portland, and its capacity will be doubled.

• EAST BAY FISHERIES, INC., San Francisco, subsidiary of F. E. Booth Co., will erect a $40,000 sardine plant at San Pablo.

• H. J. HEINZ CO. will build an $18,000 addition to the plant at Holland, Mich.

• H. B. HOOD & SONS, Boston, will use paper milk containers.

• HOVDEN FOOD PRODUCTS CO., Monterey, Calif., is erecting a new cannery to employ 100.

• IDAHO POTATO DEALERS ASSOCIATION will pack potatoes in 1-lb. 3-oz. tins this year, cooked and ready to serve.

• ITALIAN SWISS COLONY, San Francisco, has acquired a major portion of Earl Fruit Co.'s sweet-wine production. The company has also added 1,600,000 gal. storage capacity at Asti.

• KRAFT-PHENIX CHEESE CORP., Chicago, will more than double its production capacity for "Dairy Fresh" caramels.

• KROGER GROCERY & BAKING CO. will equip an ultra-modern, two-story bakery in St. Louis.

• I. MARCHIONY, INC., Hoboken, N. J., suffered complete destruction of its plant recently, but expects to have a new factory in operation before Sept. 10.

• MARSHFIELD (WIS.) CANNING CO. no longer is connected with Oconomowoc Canning Co., R. P. Binzel and Emil Umhoefer having complete charge.

• O'DONNELL PACKING CO.'s old plant at Vincennes, Ind., has been remodeled preparatory to reopening by BST Packing Co.

• PINNACLE PACKING CO., INC., Medford, Ore., has started construction of a $100,000 cold-storage plant to have a capacity of 225,000 boxes of pears.

• RATH PACKING CO. has completed a $64,000 addition to its beef house at Waterloo, Iowa.

W. F. HUBERT

For four years president of National Cheese Institute, Inc., Plymouth, Wis., he again has been reelected. Mr. Hubert is president of Lakeshire Cheese Co., Plymouth, and vice-president of Borden Cheese Co., New York. He has been in the cheese industry since 1893.

• SOUTHERN GOLD MEDAL FLOUR CO., General Mills subsidiary, will establish a blending and distribution plant in Mobile, Ala.

• TOBIN PACKING CO. has completed a $400,000 plant at Fort Dodge, Iowa.

• WEIL PACKING CO., Muncie, Ind., recently opened a $100,000 plant.

• WILSON & Co., will retire its entire funded debt of approximately $17,000,000 through a bond issue of $20,000,000, to be offered about Aug. 1.

Personnel

• WADE H. ADAMS recently was reelected president of Biscuit and Cracker Manufacturers Association of America.

• J. G. ATWATER has been chosen president of Lake Region Packing Association, Tavares, Fla.

• WALTER H. BENDFELT has resigned as president of Luick Dairy Co., Milwaukee, National Dairy subsidiary.

• J. H. BLISS quit recently as comptroller of Libby, McNeill & Libby to join Swift & Co., Chicago, as assistant treasurer.

• STANLEY BRANDE has taken full charge of vinegar manufacturing and pickling for Rhode Island Sales Co., Providence.

• MARY M. BROOKE resigned June 21 as chief chemist of Purity Bakeries Corp., Chicago, after ten years with the company and subsidiaries. She is the retiring president of American Association of Cereal Chemists.

• RALPH BROWN, manager of Midwest interests of California Packing Co., has been elected to the board of directors to fill the vacancy caused by the death of J. K. Armsby.

• F. HANLEY BROCK, formerly with Patent Cereals Co., New York, has joined the scientific staff of Farley Confections, Inc., Chicago.

• H. A. BROOKS has been appointed manager of Wilson & Co.'s plant at Eagle Grove, Iowa, succeeding G. J. Roberts.

• JESS CARTER, Quaker Oats Co., St. Joseph, Mo., heads up Association of Operative Millers. Elmer Whiteman, Washburn Crosby Co., Buffalo, is vice-president.

• GEORGE COOK becomes manager of Emmart Packing Co., Louisville.

• JAMES N. DECECCO has been made supervisor of canning for Hillsboro-Queen Anne Cooperative Corp., Baltimore.

• EMIL G. FISHER has joined the technical service division of American Maize-Products Co., New York. For 25 years in the candy manufacturing industry, Mr. Fisher recently did development work for Schrafft's.

• DR. GEORGE A. FISHER, for 23 years director of laboratories for Van Camp's, Inc., Indianapolis, has established himself as a consultant in chemical engineering, food and nutrition.

• E. M. HAYNES, Portland, Ind., was again chosen president of American Millers Association.

• R. E. JOURDAN has resigned as secretary-treasurer of Columbus Baking Co., to manage Omaha Laundry Co.

• A. L. LEONARD has been appointed by Armour & Co., to manage its south San Francisco branch, recently acquired through the purchase of Virden Packing Co. Kenneth V. Smith succeeds him as general manager at Indianapolis, coming from St. Joseph, Mo.

• CHESTER A. LYON, for several years with Chapman Dairy, Kansas City (Mo.) subsidiary of National Dairy, succeeds L. J. Chapman as president of the company.

• J. R. MANNING, chief technologist in the Bureau of Fisheries, has been awarded the degree of Doctor of Science by Western Maryland College.

• GEORGE W. MCCORMICK has resigned as general manager of Superior Sugar Refining Co., Menominee, Mich., but continues as a vice-president and director. August Ludwig succeeds him.

• JOHN T. MCGREERE for 20 years manager of Beatrice Creamery, Lincoln, Neb., has been transferred to Pittsburgh to manage the company's district plants.

• HARRY O'GRADY has been transferred from Omaha to the Denver branch of Cudahy Packing Co., to be plant superintendent.

• W. L. PRICE now manages the Tulsa, Okla., branch of Armour & Co., having succeeded H. McKay.

FRANK A. KEMP
He has been reelected vice-president and general manager of Great Western Sugar Co., Denver. The company has named no president since the death of W. D. Lippitt, in February.

• A. A. ROBINSON, Chicago, succeeds W. D. Hutchinson as president of American Oil Chemistry Association.

• JAMES SCOTT recently was named president of Greeley Cooperative Creamery Co., Grand Island, Neb.

• ELSIE SINGRUEN, formerly with Brewers Technical Review, has joined the staff of Wahl-Henius Institute, Chicago, in charge of publicity.

• NORMAN W. STEWART has been elected president of E. Pritchard, Inc. He is a brother-in-law of the founder.

• HERMAN STRONG, Grand Rapids, is the new president of Michigan Bakers' Association.

• C. R. WALTON, Stuttgart, Ark., has been elected president of Rice Millers' Association.

• H. H. WOLF has been appointed by Libby, McNeill & Libby as manager of its branch at Kansas City, Mo. He formerly was manager at Houston.

Deaths

• WILLIAM H. COLLINE, 69, operator of Newfane (N. Y.) Flour Mills for several years, June 15.

• ALBERT DIETZEN, 41, for 20 years president and general manager of Dietzen's Bakery, Inc., Anderson, Ind.

• JOHN DRUMMOND, 83, president of the Drummond Packing Co., La Crosse, Wis., June 11.

• GEORGE S. JACKSON, 70, president of Fairfield-Western Dairy Co., Baltimore, June 20.

• GUSTAVE H. MAUNTLER, 55, assistant secretary of Cudahy Packing Co., Milwaukee, June 13.

• E. C. MERRITT, 54, traffic manager of Kingan & Co., Indianapolis, and former general manager of Indianapolis Abattoir Co.

• ALFRED MIX, 49, Los Angeles office manager of Standard Brands, Inc., May 29.

• WILLIAM F. MULLEN, 80, president of the Pecoto Packing Co., Indianapolis, and a pioneer in food processing.

• LEVIN W. PHILLIPS, 70, cofounder and executive of Phillips Bros. and for half a century a member of the soft-drink bottling industry, at Baltimore, June 2.

• WALLACE D. STRACK, 45, who resigned in March, 1934, as executive vice-president and a director of Borden Co., New York. He had been ill for many months.

• MAX J. SULZBERGER, 57, former vice-president of Sulzberger & Sons Co., which later became Wilson & Co., at New York.

• JOSEPH WEINBERG, 52, vice-president of Weinberg Baking Co., Cincinnati.

Associated Industries

• COMBUSTION ENGINEERING CO., INC., New York, announces the election of F. H. Rosencrants as vice-president in charge of the proposition engineering department.

• HARNISCHFEGER CORP., Milwaukee, has appointed Charles W. Daniels as general sales manager.

• NATIONAL CAN CO., INC., is building a $360,000 addition to its plant at Maspeth, N. Y.

• OWENS-ILLINOIS SALES CO. has promoted Stanley J. McGiveran to manager of sales merchandising.

• READE MACHINERY CO., INC., has named Edwin H. Potter representative in upper New York State territory. Donald Loyhed has been appointed Cleveland representative.

• C. J. TAGLIABUE MFG. CO., Brooklyn, N. Y., has made E. D. Wacker assistant general sales manager.

Cucumber Salting

(Continued from page 336)

might be available. At the time we encountered the soft stock of several years ago, as previously mentioned, we did not have available the bacteriological data of such a study as we present herewith and, hence, we were not in a position to draw definite conclusions as to the reason for the soft stock. It is hoped that with a background of such data as is here presented, it will be possible, if the occasion again arises, to make a bacteriological study of a salting which results in soft (not slimy) stock and to trace the trouble to its source.

THE details of our procedure will be evident from the tabulated data, and the general plan of the study is indicated by the following outline of the bacteriological work:

Samples of brine were obtained from vats of brined cucumbers the day of filling, and at intervals of 7, 14, 21, 28, 42, 56 and 116 days. On these samples the acid and salt contents, the pH, and the plate counts (dextrose agar incubated 48 hours at 35 deg. C.) were obtained. Various types of organisms were isolated and grouped as follows:

(*a*) High acid producers of *Lactobacilli* type.

(*b*) Low acid producers of *Leuconostoc* type.

(*c*) Round yeasts.

(*d*) Ellipsoidal yeasts (so-called scum yeasts).

(*e*) Spore-forming bacteria suspected of reducing acidity.

(*f*) Unclassified.

Typical organisms of these groups (except *f*) were studied, and a number of them tentatively identified.

The salting was done at Norfolk, Va., with locally grown cucumbers. The weather of the growing season was such that the cucumbers grew well, but not too rapidly. There was no marked evidence of aphids, mosaic, blight, etc., in the fields, which could have been considered as an influencing factor. The practice of using fertilizer is general in this growing district. About an 80-deg. salinometer brine was used as a cushion in starting the vats and the fermentation was allowed to proceed as indicated below.

Under the tabulations headed Table I and Table II is given the key to the identity of the colonies described subsequently (see page 336). Our procedure was to have samples taken from the day after filling and battening down the vat, and periodically thereafter to 116 days later, in order to give a good bacteriological picture of the organisms present from the beginning of the fermentation to practically complete curing. Several tanks or vats were followed in this manner and we are presenting data here from two which were typical. Several of the cultures typical of the various species were then studied further with the object of establishing more definitely their identity (see page 335).

FORMATION of acid in fermenting pickles is due chiefly to the strains identified as (*a*) *Lactobacillus cucumeris* and (*b*) *Leuconostoc,* probably *mesenteriodes* and *dextranicum.* The *Lactobacillus* group is mainly responsible for acid formation.

Formation of acid by round yeasts is negligible and most likely is not a desirable reaction.

Reduction of acidity is due mainly to ellipsoidal yeasts. The presence of alkali-forming bacteria (similar to those found in milk) or types reducing acidity in other ways is doubtful. Since the scum yeasts are active acid-reducers, consideration should be given to promoting conditions which will repress their growth. Our strains showed growth in broth at pH 6.2 and 13 per cent salt, and in broth at pH 3.0 and 10 per cent salt.

Three strains of bacteria (two of them unidentified) which were suspected of being harmful in some way or other were studied. Their growth is inhibited by 8 per cent salt in plain broth (pH 6.7) and by a pH of 4.0 without salt. Therefore, in commercial practice, it is desirable to come to these conditions of acidity and salinity as quickly as possible. In fact, the data indicate distinctly the value of using small amounts of a suitable mineral acid (such as hydrochloric) to immediately achieve a pH of about 4 at the beginning of the fermentation, which has the advantage of suppressing undesirable organisms and giving to the stock, from the day the tanks are battened down, the protection ordinarily achieved only after sufficient lactic acid has developed to reach this pH. Arriving at the protective pH range in this manner also permits a much more rapid salting, because it is then not so essential to rely upon the development of virile lactic acid producing strains.

It is a pleasure to acknowledge our indebtedness to Mr. D. S. Merritt, in charge of The Best Foods, Inc., plant at Norfolk, Va., for his assistance and cooperation, and to Mr. G. Winckelmann, manager, manufacturing operations, The Best Foods, Inc., New York, N. Y.

References

(1) Fabian, F. W., Bryan, C. S., and Etchells, J. L., Experimental Work on Cucumber Fermentation, Agric. Expt. Sta. Mich. State College Technical Bull. No. 126, Nov. 1932.

(2) Hucker, G. J., and Pederson, Carl S., Studies on the Coccaceae. N. Y. State Agric. Expt. Station Tech. Bull. No. 167, July 1930.

Sales Accounting

(Continued from page 324)

profit and loss statement for each salesman, as shown in Table VI. This, in addition to aiding in expense control, is helpful to the sales executive in managing his department.

Question may be raised as to whether the data as to costs and profits by size of orders are representative for all companies, all routes and all periods. It is quite improbable that this is so to the extent that the cost differentials obtained in this study could be used as the basis for a price policy. It is necessary that each company using the method make its own analysis; but the company studied is sufficiently typical of the industry, so that the cost differential and the distribution of profits among various sized orders would probably be similar for most companies.

Moreover, the cost and profit data are probably sufficiently representative for all the routes of one company. A study of a few routes should fairly represent all the routes: as in this study, although the routes studied were radically different in character, the findings are similar throughout.

IN THE matter of periods, it is reasonable to suppose that occasional analyses would suffice, as there is no reason to believe that either seasons or market conditions would appreciably affect the relationship of profits or distribution costs by size of orders. It is to be expected, however, that over a period of time sales methods and policies change and hence, new cost and profit studies should be made frequently.

However, to obtain the full value of these analyses, the studies should be made continually, as individual profit and loss statements, such as Table VI, are only then significant. This is likewise desirable for purposes of expense control.